

Tis to the Pen & Press we Mortals owe.
All we believe & almost all we know.
All hail ye great preservers of those arts.
That raise our thoughts & cultivate our parts.



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THE INSTRUCTOR; OR, Young Man's Beſt Companion.

CONTAINING

Spelling, Reading, Writing, and Arithmetic in an eaſier Way than any yet publiſhed.

Inſtructions to write Variety of Hands with Copies. How to write Letters on Buſineſs or Friendſhip; Forms of Indentures, Bonds, Bills of Sale, Receipts, Wills, Releaſes, &c.

Merchants Accompts, and a ſhort and eaſy Method of Shop and Book-keeping. With a Deſcription of the Product, Counties, Market-towns, and Fairs according to the New Style, in England and Wales.

The Method of meaſuring Carpenters, Joiners, Sawyers, Bricklayers, Plaiſterers, Plumbers, Maſons, Glaſiers, and Painters work: how to undertake each Work, and at what Price: the Rates of each Commodity, and the common Wages of Journey-men. With the Deſcription of Gunter's Line, and Coggeſhall's Sliding Rule.

The Practical Gauger made eaſy. The art of Dialling, and how to erect and fix Dials: With Inſtructions for Dyeing, Colouring, and making Colours; and ſome general Obſervations for Gardening every Month in the Year.

TO WHICH ARE ADDED,

The FAMILY'S BEST COMPANION: A COMPENDIUM of GEOGRAPHY and ASTRONOMY: and ſome uſeful INTEREST TABLES.

BY GEORGE FISHER, ACCOMPTANT.

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PREFACE.

I NEED ſay but little by way of preface, in relation to the uſefulneſs of this book, the title-page ſo fully declaring its contents; but as a preface is uſually expected, I cannot well avoid ſaying ſomething with reſpect to its utility.

As to the firſt ſtep of forming the young man's mind for buſineſs, *viz.* the being inſtructed in, and acquainted with, our mother-tongue, *viz.* Engliſh, it muſt be, and is, acknowledged by all to be a neceſſary and principal qualification in buſineſs, and therefore it is of great importance to be well acquainted therewith.

In the next place, to write a good, fair, free, and commendable hand, is equally neceſſary in moſt, if not in all the affairs of life, and occurrences of buſineſs.

The young man is next informed how to indite epiſtles or letters in a familar ſtyle, and on ſundry ſubjects or occaſions; with directions how to ſubſcribe or conclude a letter, and alſo to ſuperſcribe or direct letters, according to the different ranks and qualities of the perſons to whom directed: and this muſt be allowed to be a very great additional qualification.

The next accompliſhment for a young man, and largely treated on in this book, is that excellent ſcience of *Arithmetic*, both vulgar and decimal; leading him by the hand, and by eaſy ſteps, through its whole courſe.

Again, the young man is next ſhewn the ingenious art of Book-keeping after the Italian manner, by way of double entry; and that is an accompliſhment that capacitates him for buſineſs in the higheſt degree; under which head, he is alſo informed how to draw out, or make various accounts or writings relating to mercantile affairs; as bills of lading, invoices, accounts of ſales, together with authentic examples of bills of exchange, with notes concerning them; likewiſe bills of parcels of divers kinds: alſo various ſorts of receipts, *&c.* All which is expedient for a man to know and underſtand, if he would be dextrous in buſineſs.

The young man is here alſo inſtructed in relation to the affairs of buſineſs at the water-ſide, as to ſhipping off and landing goods, *&c.*

He hath alſo a deſcription of England and Wales, each county being particularly ſpoken of, with reſpect

to its product, ſoil, and extent; likewiſe the names of its ſeveral market-towns, and a liſt of the fairs now held in them, as they have been ſettled ſince the alteration of the ſtyle.

Here are alſo eaſy, plain, and likewiſe curious directions for meaſuring all ſorts of planes and ſolids, (arithmetically and inſtrumentally) as the works of carpenters, joiners, ſawyers, bricklayers, maſons, plaiſterers, painters, glaſiers, *&c.* with the prices of their works.

Here are likewiſe ſhewn the methods of extracting the ſquare and cube roots, with ſome of their uſes, in relation to meaſuring. *&c.*

Alſo practical gauging of divers kinds of veſſels, tuns, *&c.* Likewiſe dialling in various kinds, with the repreſentation of ſeveral ſorts of dials, and how to beautify and adorn them.

Next, are precedents of law-writings, as bonds, bills, indentures, wills, letters of attorney, *&c.*

Laſtly, ſome directions relating to the pleaſant and delightful art of gardening, with general obſervations for every month in the year. To which are ſubjoined ſome inſtructions to young women, how to pickle and preſerve all kinds of fruits and flowers, *&c.* with inſtructions for making divers ſorts of wines of Engliſh growth; and alſo for preparing many excellent medicines, plaiſters, *&c.* with ſeveral good preſcriptions of proper uſe againſt moſt diſtempers; fit for, and neceſſary in all families.

To the whole is now added a compendious ſyſtem of geography and aſtronomy; the firſt is of great utility to the trading part of mankind, and to thoſe who would have an adequate idea of what they read in hiſtory, or otherwiſe, of the tranſactions in different parts of the earth; and the ſecond is of like ſervice to thoſe who would contemplate on heavenly bodies, and is purpoſely deſigned to give the unexperienced reader ſome ſmall idea of the almoſt inconceivable number of bodies, (moſt of them much ſuperior in magnitude to our world) which the Almighty and Infinite Creator hath placed in the univerſe, and exhibited to the view and conception of mankind.

Alſo conciſe tables to find the value of Portugal pieces, to buy or ſell by the great hundred; and to ſhew the intereſt of any ſum at 3, 4, and 5 *per cent.*

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INDEX;

OR,

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THE

THE

Young Man's Beſt Companion.

INSTRUCTIONS for YOUTH, to SPELL, READ, and WRITE true Engliſh.

The uſe of Letters: *which are* Vowels, *and which* Conſonants; *what* Diphthongs *are, their number, and how pronounced and written.*

THE deſign of this book being to inſtruct mankind, eſpecially thoſe who are young, in the methods of converſing, and tranſacting buſineſs in the world; therefore, that moſt neceſſary accompliſhment of ſpelling, and writing good and proper Engliſh, claims the firſt notice; for, let a perſon write ever ſo good a hand, yet if he be defective in ſpelling, he will be ridiculed and contemptibly ſmiled at, becauſe his writing fair will render his orthographical faults the more conſpicuous. Therefore,

Firſt, Take notice, that of letters are made ſyllables, of ſyllables words, and of words ſentences, *&c.*

The letters are in number 26; viz. *a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, ſ, t, u, v, w, x, y,* and *z*; of theſe *j* and *v* were formerly wrote *i* and *u*, and have for that reaſon been frequently called *i* conſonant, and *u* conſonant; but they have been of late more properly called *ja* and *ve*. In theſe letters we are to obſerve their names, their form, and their force: their names, whereby to know them; their form, whether great or ſmall; and their force, whether in pronunciation or utterance.

Letters are diſtinguiſhed according to their ſound, into vowels and conſonants. A *vowel* is a letter that ſoundeth by itſelf, and they be ſix in number, viz. *a, e, i, o, u,* and *y*, the Greek vowel, which is an Engliſh vowel when it cometh after a conſonant, and hath the ſound of *i*; as in by, fly, reply, ſyllable, &c. but is never uſed in words not derived from a foreign language, otherwiſe than at their end. A *conſonant* is a letter that ſoundeth not, except it be joined with a *vowel*, for without one of the

vowels no ſyllable can be made; as *b*, *c*, *d*, &c. without the aid of a vowel, cannot be ſounded. Though we have twenty-ſix letters, and ſix of them vowels, yet we have twenty-one conſonants; for *y*, when ſet before any vowel in the ſame ſyllable, becomes a conſonant, as in youth, yonder, beyond, &c. Note, That *j* hath the ſound of *g*, as in joint, jangle, jingle, &c.

When two vowels come or meet together in a ſyllable, and are not parted in the pronunciation, but united in one ſound, ſuch are called *diphthongs*; of theſe there are thirteen, viz. *ai*, *ei*, *oi*, *ui*, *au*, *eu*, *ou*, *ee*, *oo*, *ea*, *eo*, *oa*, and *ie*; as in maid, faith, either, join, juice, eunuch, ſtout, feed, food, broad, ſtealth, wealth, people, ſteeple, boat, goat, heat, beat, feat, friendſhip, field, &c. Note, That in the firſt ſix words both vowels are ſounded, but in the other ſixteen one of them is ſcarcely heard.

There are alſo thoſe that are called *triphthongs*, where three vowels meet in one ſound; as in beauty, beau, lieu, and quaint: Likewiſe *ay*, *ey*, *oy*, *uy*, *aw*, *ew*, *w*, become *diphthongs* at the end of words but are called *improper diphthongs*, as in ſay, key, joy, ſaw, bow, &c. Note, *aw*, *ew*, and *ow*, are commonly ſounded as *au*, *eu*, and *ou*.

Of Letters, great *and* ſmall, *and when to be uſed.*

FIRST, negatively, *great letters* are not to be uſed in the middle or latter end of a word, except the whole word be ſo written, as in JEHOVAH, LORD, or in titles of books, &c. for it would be very abſurd to write thus: To Mr. geoRgE RoGeRs in thaMes StReEt; inſtead of, To Mr. George Rogers in Thames Street.

Secondly, poſitively, *great letters* or *capitals*, are to be written at the beginning of ſentences; as, Fear God, Honour the King. Know when to ſpeak, and when to hold your tongue.

After every period, or full ſtop, when new matter begins; as, Some time after that accident, another happened, which was as follows.—On the 16th of May, &c.

At the beginning of all proper names of places, ſhips, rivers, &c. as London, the Dreadnought, Thames, Severn; alſo the Chriſtian names and ſurnames both of men and women muſt begin with a great letter; as Samuel Sharp, Mary Sweetings, &c.

At the beginning of the more eminent words in a ſentence; as Faith is the foundation of the Chriſtian religion;

or

or of any word that we have a particular regard or deference for; as God, Chriſt, King, Queen, &c.

At the beginning of every line in poetry; as,

Improve your time. Time paſſeth quickly on:
Nor doth ſo good ſucceed, as that that's gone.

Note, The perſonal pronoun *I*, and the interjection *O*, muſt be always wrote in capitals; for it is ridiculous to be written thus, On Monday laſt *i* came to your houſe, but you was not at home; *O* how it grieved me!

Laſtly, All nouns ſubſtantive may begin with a great letter; and a ſubſtantive may be known by the ſigns either of *A*, *an*, or *the*, before them; as, a Houſe, a Mill, an Ox, an Aſs, the City, the River, &c. but the adjective (which declares what ſort of a thing the ſubſtantive is) ſhould be wrote with a ſmall letter; as, the white Horſe, the long Rope, brown bread, fat Beef, &c. Small letters are commonly wrote in all other places. Note, This cuſtom of beginning all ſubſtantives with capital letters, is not followed, at preſent, by polite authors.

S is commonly written *ſ* at the beginning and in the middle of words, and *s* at the end; but if two of them come together in the middle of a word, they may be written thus, *ſſ*, or *ſs*.

Obſervations concerning the Sound *of* Letters, *and which are* omitted *in pronunciation.*

A Is not ſounded in Pharaoh, nor in Sabaoth; but as if written Pharo and Saboth; neither in marriage, but as marrige; alſo parliament, as parliment, and chaplain, as chaplin, &c. In ſome proper names it is not ſounded, but dropped in the pronunciation; as in Aaron, Iſaac, Canaan, Balaam; which are pronounced as if written Aron, Iſac, Canan, Balam; but we muſt except Ba-al and Ga-al. *A* is ſounded broad like *aw* in words before *ld* and *ll*; as in bald, ſcald, hall, wall, fall, &c.

B is not ſounded in thumb, dumb, plumb, lamb, doubt, debt, ſubtle, &c. but ſounded as if written, thum, dum, plum, lam, dout, det, ſuttle.

C is ſounded hard like *k*, before *a*, *o*, and *u*, and before *l* and *r*; as in theſe words, cane, came, comb, cube, clay, crane, crab; and ſoft in cement, city, and tendency. *C* loſeth its ſound in ſcene, ſcience, victuals, and verdict; likewiſe in indict, indictment; alſo before *k*, as in ſtack, rack, kick, thick, brick. In words of Greek

and Hebrew derivations, *c* is ſounded like *k*, as in ſceptic, Cis, Aceldama.

Ch is ſounded like *k* in many foreign words; ſome of which occur in the Holy Scriptures; as in chorus, chemiſt, Chryſoſtom, Chriſt, Chedarlaomer, Baruch, Archippus, &c In the word ſchiſm, the ſound of *ch* is loſt, it being ſounded as if wrote ſiſm; and in the words Rachel, cherubim, and archbiſhop, it is ſounded in the Engliſh manner. *Ch* in French words ſounds like *ſh*, as in chevalier, pronounced ſhevalier; machine, maſheen; mareſchal, marſhal; capuchin, capuſheen; chaiſe, ſhaiſe, &c.

D is not ſounded in ribband, nor in Wedneſday; which are pronounced ribbon and Wenſday: the termination *ed* is often ſhortened into *t*: as burned, burnt; choaked, choakt; ripped, ript; paſſed, paſt; chopped, chopt, &c.

E is not ſounded in heart, neither in hearth, or dearth, &c. *E* final that is placed at the end of a word, is ſeldom heard but in monoſyllables; as in me, he, ſhe, ye, the, &c. where it hath the ſound of *ee:* And in words derived from foreign languages, in which *e* hath its perfect ſound, as Jeſſe, Jubilee, Mamre, Nineve, Candace, Cloe, Eunice, Penclope, Salmone, Phebe, epitome, cataſtrophe, Gethſemane, ſimile, premunire, &c. In all other caſes *e* final ſerves only to lengthen the ſound, and to diſtinguiſh it from other words of different meaning, which are wrote without *e*, and are ſounded ſhort; as in theſe examples following, viz. cane, can; hate, hat; bite, bit; fare, far; hope, hop; made, mad; mane, man; ſcrape, ſcrap; ſtare, ſtar; tune, tun; write, writ; &c. In words of more than one ſyllable, it lengthens the ſound of the laſt ſyllable, but doth not increaſe the number of ſyllables; as admire, demiſe, blaſpheme, &c. *E* lengthens the ſyllable alſo in ſome foreign words; ſuch as, Eve, Tyre, Crete, ode, ſcheme, dialogue, Kenite, and Shu-lamite. *E* is ſeldom wrote after two conſonants; as in paſs, turn, black; not paſſe, turne, blacke. Yet after *rs* it is uſed, as horſe, nurſe, purſe; not hors, nurs, purs. Alſo the words ending in *cre*, *gre*, and *tre*, ſound the *e* before the *rs* as in theſe words, acre, lucre, centre, ſepulchre, maugre, mitre, luſtre; which are ſounded as if written aker, luker, center, ſepulcher, mauger, miter, and luſter. *E* final alſo ſerves to ſoften *c* and *g*, as in ace, place, lace, ſpice, truce, oblige, huge, age, &c. If nouns in *e* final take *s* after them with an apoſtrophe before, it ſtands

ſtands for his; as the Pope's eye, or the eye of the Pope; the table's foot, or the foot of the table: if without an apoſtrophe, it makes the plural number, as Popes, tables. Words derived from thoſe wrote with *e* final, ſeldom retain it, as in writing, loving, doing, &c. not writeing, loveing, or doeing; except in the terminations *ge* and *ce* before *able*, as in changeable, peaceable, &c. *E* ſhould not be written after a diphthong, in theſe words, vain, main, gain, fear, know, &c. not vaine, maine, gaine, &c. *E* final is annexed, but not ſounded, in thoſe words which would otherwiſe end with *i*, *o*, or *u*; as in die, foe, ſhoe, true, virtue, &c. but there are ſome exceptions, as do, ſo, to, &c. Laſtly, There are ſome words in which the final *e* doth not lengthen the ſound, as give, live, ſome, one, done, &c.

F in plurals is changed into *v*: as wife, wives; ſtaff, ſtaves.

G is not ſounded in ſign, reign, gnaw, gnat, aſſign, deſign, ſeignior, ſeraglio, phlegm, &c. *G* is ſounded ſoft in gender, ginger, and gipſy; but hard in Gibeon, Giberah, Gilboah, Gethſemane; and in theſe proper names, Gibſon, Gilman, Gilbert; and likewiſe in theſe common words, gelt, geld, gird, gimp, geeſe, gander, gabble, gather, gild, &c. Obſerve, That if *g* be hard with a long vowel, *ue* is joined, and pronounced in the ſame ſyllable; as in plague, Prague, Hague, rogue, league, dialogue, catalogue, &c.

Gh in the end of ſome words, where *au* or *ou* goes before, hath the ſound of *ff*; as in tough, rough, cough, laugh; ſounded as if tuff, ruff, coff, laff; but buff, cuff, and ſnuff, muſt be ſo written.—*Gh* is not ſounded in mighty, though, through, daughter, and Vaughan.

H hath place, but no ſound in chronicle, Chriſt, ghoſt, John, Rhine, ſchedule, ſchiſm, &c. *H* is not ſounded at the end of words, if it be alone; but with *tc* before it, it is ſounded, as ſnatch, watch, &c.

I is not ſounded in adieu, juice, veniſon, fruit, bruiſe, Saliſbury: It is ſounded like *ee* in oblige, magazine, machine, &c. *I* is ſounded long in proper names ending in *iah*, as Jeremiah, Hezekiah, but ſhort in Ariel, and Miriam.—*I* is ſounded like *u* in firſt, dirt, bird, &c.

K is nearly allied in ſound with *c*; but to know when to uſe one, and when the other, note, that *c* hath the force of *k* only before *a*, *o*, *oo*, and *u*, and thoſe two conſonants

l and *r*; and therefore, we muſt not write kare for care; kow for cow; krown for crown: and the uſe of *k* is only before *e*, *i*, and *n*; wherefore we muſt write, keep, key, knight, kill, &c. not ceep, cey, cnight, nor cill: But the words calendar, Catharine, are wrote ſometimes kalendar, Katharine. *K* is written after *c* only in pure Engliſh words, ſuch as back, deck, ſick, &c. for the beſt authors have omitted it in words derived from the Greek and Latin, ſuch as public, muſic, phyſic, &c.

L is not ſounded in calf, half, chalk, ſtalk, walk; thoſe words being pronounced as if written cauf, hauf, chauk, ſtauk, wauk. Neither is *l* pronounced in Briſtol, Holborn, Lincoln, ſalmon, chaldron; theſe are ſounded as if writ Briſtow, Hobourn, Lincon, ſammon, and chaudron; nor in colonel, where the firſt *l* hath the ſound of *rr*, as corronel.

In the word accompt, *mp*, is ſounded like *un*.

N is not heard in autumn, kiln, ſolemn, limn, hymn, column, and condemn.

O is not ſounded in people, feoffe, baſon, mutton, yeoman, maſon, righteouſneſs, bacon, jeopardy, and crimſon. —*O* ſometimes ſounds like *oo*; as in doing, moving, proving, &c.—*O* is ſometimes ſounded like *i*, as in women, and flagon, pronounced as if winmen, and flagin. And ſometimes *o* is ſounded as *u*, as in money, conduit, conjure, attorney, Monmouth, &c. being heard as if writ munny, cundit, cunjure, atturney, Munmouth, &c. and it is ſounded like *oo*, in do, to, prove, move, &c.

P is written but not ſounded in empty, preſumptuous, pſalm, ſumpter, attempt, pſalter, and ſymptom; alſo in ſumptuous, contemptuous, receipt, conſumptive, &c.

Ph hath the ſound of *f*, when together in one ſyllable; as in philoſophy, phyſician, Aſaph, and elephant; but we muſt not write filoſophy, fyſician, nor Aſaf, or elefant; *Ph* are parted in ſhep-herd, up-hold, and in Clap-ham, and other ſuch compounded words.

After *Q* always follows *u* in all words; and in ſome French and Latin words they have the ſound of *k*; as in riſque, liquor, banquet, conquer, maſquerade, chequer; pronounced as riſk, likker, banket, &c. to which add oblique, relique, antique, &c. which are ſounded as if written oblike, relike, antike, &c.

S is not ſounded in iſland, viſcount, and Liſle; which are pronounced as if wrote iland, vicount, and Lile.

S at

S at the end of words, ſounds hard like *z* in words of the plural number, and in words of the third perſon, as names, worms, he reads, ſhe hears. *S* ſounds hard in ſome words that terminate in *ſion*, as in circumciſion, evaſion, deluſion; but after a conſonant ſoft, as in converſion, commiſſion, dimenſion. *S* is likewiſe ſounded hard in theſe words, raiſe, praiſe, chaiſe, cheeſe, theſe, compoſe, expoſe, bruiſe, refuſe, applauſe, clauſe, wiſdom, caſement, and damſel.

Th ſounds fine in thin, think, and wrath; and is ſounded hard in the, then, they, that, blithe, tithe and ſcythe; alſo in mother, brother, hither, thither; and in loath, cloath, and clothier, &c.

Ti before a vowel or diphthong hath the ſound of *ſi* or *ſh*; as in patience, dictionary, Gratian, oblation, nation, tranſlation; except when *ſ* goes juſt before it, as in theſe words, queſtion, fuſtion, baſtion, combuſtion, celeſtial, beſtial, &c. But in ſome words of Hebrew and Greek *ti* retains its natural ſound; as in Shealtiel, Phaltiel, Shephatiah, Cotittia, Adramyttium, and the like; and in the Engliſh derivatives, mightier, and mightieſt, emptieſt, emptied, pitiable, &c.

U is ſounded like *i* in bury, birry; buſy, bizzy; buſineſs as bizneſs. *U* is ſometimes written after *g* without being ſounded, as in guide, guard, *&c.* It is alſo ſilent in the words buy, build, conduit, circuit, labour, favour, honour, *&c.* but it is ſounded in others, as anguiſh, languiſh, Montague, &c.

W is not ſounded in anſwer, ſword, whore, ſwoon, *&c.* neither is it heard before *r* in wrap, wrath, wrong, *&c.*

Wh belong to words purely Engliſh; as what, when, where, *&c.*

X is ſounded as *z* in Xenophon, Xerxes, Xenocrates, and Xantippe.

Y is either a vowel or conſonant, as hinted before. A vowel in my, by, thy; and ſometimes, when a vowel, it hath the ſound of *ee;* as in worthily, Chriſtianity liberty, formerly, *&c.* In derivative Engliſh words having the termination *ing*, *y* is uſed in the middle of the word; as in buying, dying, marrying, &c.

The diphthongs *ai* and *ay* have the ſound of *a* in air, fair, pair, may, ſtay, play; but *a* is loſt in Calais (a town in France); and pronounced ſeparately in Sinai (a mountain of Arabia).

Ei and *ey* are ſounded like *a* in eight, ſtreight, neighbour, heir, veil, and convey; like *e* in key, and like *i* in ſleight.

Oi and *oy* have a ſound peculiar to themſelves; as in oil and oyſter; but make no diphthong in the derivatives, going, doing, &c.

Au and *aw* commonly keep a proper ſound; as in augur, auſtere, draw, maw, &c. but *u* is loſt in aunt and gauger, being ſounded as ant and gager; they make no diphthong in Em-ma-us and Ca-per-na-um.

Eu and *ew* have an united ſound in moſt words, as in feud, brew, new, and grew; but *eu* is no diphthong in Zac-che-us and Bar-ti-me-us.

Ou is expreſſed in foul, ſoul, proud, loud; and *ow* in how, cow, and now; but *ou* ſounds like *oo* in ſoup (a French diſh), and Couper (a man's name), which are ſounded as if ſoop and Cooper.

Ee is no diphthong in Be-e-rites, Be-er-ſhe-ba, and in words beginning with *re*, or *pre*; as re-en-ter, pre-e-minence: In Beelzebub one of the *e*'s is not ſounded.

Oo is properly ſounded in cool, fool, pool, root, and took, but hath the ſound of *u* in ſoot, and foot; it makes no diphthong in Co-os, co-operate.

Ea ſounds like *e* in ſea, pea, ſeam, ream, bread, head, lead, dead, leather, feather, heaven, leaven, and creature; it is no diphthong in ven-ge-ance, miſ-cre-ant, or any Hebrew, Greek, or Latin words; as in Kadeſh Bar-ne-a, Kir-jath-je-a-rim, nor in Ce-ſa-ria, i-de-a, o-ce-an, re-al, be-a-ti-tude; nor in words beginning with *pre*, as pre-am-ble, &c.

Eo is no diphthong in dunge-on, hide-ous, mete-or, pige-on, the-o-ry, &c.

Oa is ſounded as *o* in goat, boat, and coat; it is ſounded broad as *au*, in broad, groat; but is no diphthong in Goa (a city in India), or in the Hebrew words Zoan, Gilboa.

Ie before a ſingle conſonant, ſounds like *ee*, as in brief, chief, and thief; but if before two conſonants, it ſounds like *e*, as in friend, field; but at the end of Engliſh words, the *e* is not heard, as in die, lie, tie; it is no diphthong in A-bi-e-zer, E-li-e-zer, nor in the Engliſh words di-er, car-ri-er, clo-thi-er; nor in words derived from the Latin; as cli-ent, ori-ent, qui-et, and ſci-ence.

Ui

Ui is ſounded as *u* in juice, fruit, and ſuit, but *u* in moſt in conduit, build, and guiſe; and is no diphthong in ſe-ſu it, ge-nu-ine, and fru-i-tion.

Æ and *Œ* are not Engliſh diphthongs; they are uſed in *Æſop*, *Æneas*, *Ætna*, *Cæſar*, *Œdipus*, œconomy, and ſound like *e*; but in common words they are neglected; as in equity, female, and tragedy, though derived of æquitas, fœmina, and tragœdia.

Of Syllables, *and their Diviſion, being the Art of Spelling.*

A *SYLLABLE* is taking letters together, and uttering them in one breath, as vir-tue; ſo that virtue being thus divided, or taken aſunder, makes two ſyllables, viz. vir and tue, which put together, form the word virtue. And many times a vowel, or a diphthong, of themſelves, make a ſyllable, as in a-bate, e-ve-ry, i-dle, o-ver, u-ſu-ry, and in au-gur, Eu-ſtace, ow-ing, oy-ſter, Ea-ton, oa-ten. No ſyllable can be made, be there never ſo many conſonants, or ſo few, without the aid of a vowel or diphthong.

The longeſt monoſyllables we have in Engliſh are length, ſtrength, and ſtreight, which could not be ſounded without the vowel *e* or *i*.

The art of ſpelling may be reduced to theſe four following general rules or heads.

1ſt, When a conſonant comes between two vowels, in dividing the words into ſyllables, the conſonant is joined to the latter vowel; as in ſta-ture, na-ture, de-liver, unity, &c. except compound words which terminate in *ed*, *en*, *eſt*, *eth*, *ing*, *iſh*, or *ous*; as coaſt-ed, gold en, know-eſt, know-eth, bear-er, dy-ing, co-vet-ous, ra-ven-ous, and ſub-urbs.

2dly, When two conſonants come together in the middle of a word, they are to be parted, if not proper to begin a word; as num-ber, ſtran-ger, for-tune, &c. not numb-er, ſtrang-er, fort-une: When the ſame conſonant is doubled in a word, the firſt belongs to the foregoing, the latter to the following ſyllable, as in the rules above, and in thoſe words, Ab-ba, ac-cord, an-no, ad-der, &c.

3dly, Conſonants that can begin words muſt not be parted in the middle; as a-gree, be-ſtow, re-frain, &c. not ag-ree, beſ-tow, ref-rain.——Theſe conſonants may begin words, viz. *bl*, *br*, *ch*, *cr*, *dr*, *dw*, *fl*, *fr*, *gh*, *gl*, *gr*, *kn*, &c. as blunt, break, chaw, cry, draw, fleſh, ghoſt, &c.

4thly.

4thly, When two vowels come together, not making a diphthong, they muſt be divided, as in vi-al, va-li-ant, Li-o-nel, du-el, cru-el, me-te-or, and La-odi-ce-a.

Some particular notes.

L is doubled in words of one ſyllable; as well, tell, ſwell, hall, wall, fall, will, hill, mill, &c. but in words of more than one ſyllable the word always terminates with ſingle *l*; angel, Babel, hurtful, beautiful, and dutiful. Neither muſt *l* be doubled in alway, alſo, although; not allway, alſo, alithough, &c. But words accented on the laſt ſyllable, muſt be excepted from the rule above, viz. inſtall, recall, inroll, rebell, repell.

Y muſt be uſed before the termination *ing*; as buying, lying, carrying, marrying, paying, ſlaying, burying, &c.

The long *ſ* muſt never be uſed at the end of a word, or immediately after a ſhort or ſmall *s*.

X ſhould be uſed inſtead of *ct*, where it appears to have been in the original; as reflexion, connexion, rather than reflection, connection.

If you cannot write out the whole word at the end of the line, you muſt break off at the end of a ſyllable, thus, ——————con- demn; not thus——cond- emn. | Again, ——————diſ- charge; not——diſc- harge.

C muſt not be put between two conſonants; as think, not thinck; thank, not thanck; brink, not brinck; but if a vowel goes before *c* you muſt write *c* before *k*, as brick, thick, ſtick, &c.

Ph muſt be retained in words of a foreign original; as prophet, not profet.

Of *S* and *C*. Some people may eaſily drop into error by miſtaking *S* for *C*, as in the beginning of the following words, where *C* hath the perfect ſound of *S*, though *C* muſt undoubtedly be written, viz in

Ceiling	Cinnamon	Cell	Ceruſe
Celeſtial	Ceremony	Celerity	Centre
Civet	Cellar	Cypreſs	Cinque
Certain	Cenſure	Circle	Cipher
Cymbal	Cenſor	Circuit	City
Ciſtern	Ceaſe	Cement	Citron
Centurion	Celebrate		

But theſe words muſt be written with *S*, viz.

Science	Sceptre	Scarcity	Sciatica
Schedule	Scheme	Schiſm	Scythian

The following words ſhould be wrote

with *ti.*	with *ſi.*
Contention	Confuſion
Action	Occaſion
Contradiction	Contuſion
Attention	Oppreſſion
Benediction	Alluſion
Apparition	Aſcenſion
Concoction	Averſion
Declaration	Aſperſion
Ambition	Commiſſion
Contrition	Comprehenſion
Oration	Circumciſion
Oblation	Concluſion

The following words ſhould be ſpelt thus,

Paſſion, not paſhion.	Saliſbury, not Salſbury.
Faſhion, not fation.	Leiceſter, not Leſter
Cuſhion, not cuſhon.	Shrewſbury, not Shroſbury.
Glouceſter, not Gloſter.	Carliſle, not Carlile.
Worceſter, not Worſter.	Weſtminſter, not Weſtmiſter.

Another qualification in ſpelling is rightly to diſtinguiſh word of the ſame ſound, though widely different in their ſenſe and ſignification; ſuch as theſe that follow, viz.

A	Alloy, baſe metal
ABel, Cain's brother	Altar, for ſacrifice
Able, to do a thing	Alter, to change
A bell, to ring	Ale-hoof, an herb
Accidents, chances	Aloof, at a diſtance
Accidence, a book	Allowed, approved
Acre, of land	Aloud, to ſpeak ſo
Acorn, of an oak	Amiſs, wrong
Achor, a valley of that name	A miſs, or miſtreſs
Advice, counſel	Ant, a piſmire
Adviſe, to counſel	Aunt, a father's ſiſter
Account, eſteem	Anchor of a ſhip
Accompt, or reckoning	Anker a runlet
Ale, a drink	A peal of bells
Ail, trouble	Appeal, to higher powers
All, every one	Appear, to be ſeen
Awl, for ſhoemakers	A peer, a lord
Alley, a narrow place	Aray, good order
Ally, a friend or confederate	Array, to cloath
Allay, to give eaſe	A roſe, to ſmell to

Aroſe,

Aroſe, did ariſe
Are, they be
Air, we breathe
Heir, to an eſtate
Arrant, notorious
Errand, meſſage
Arrows, to ſhoot
Arras, hangings
Harraſs, to fatigue
A ſcent, or ſmell
Aſcent, a going up
Aſſent, agreement
Aſſiſtance, help
Aſſiſtants, helpers
Augur, a ſoothſayer
Augre, to bore with
Ax, to cut with
Acts of parliament
Auſtere, ſevere
Oyſter, a ſhell-fiſh

B

Babel, the tower
Babble, to prate
Bacon, hog's fleſh
Baken in the oven
Beckon, to make a ſign
Beacon, to be fired on a hill
Bail, a ſurety
Bale, of goods
Bald, without hair,
Bawl'd, cried out
Ball, to play with
Bawl, to cry aloud
Barbara, a woman's name
Barbary, in Africa
Barberry, a fruit
Bare, naked
Bear, a beaſt, or to bear
Bays, of bay-trees
Baize, cloth of Colcheſter
Baſe, vile
Baſs, in muſic
Belly, part of the body
Belie, to ſpeak falſely
Be, they are
Bee, that makes honey
Beer, to drink
Bier, to carry the dead on
Bell, to ring
Bel, an idol
Berry, a ſmall fruit
Bury, the dead
Blue, a colour
Blew, did blow
Board, a plank
Bor'd, a hole
Boar, a beaſt
Bore, to make hollow
Boor, a country-fellow
Bold, confident
Bowl'd, at the jack
Bolt, the door
Boult, the meal
Beau, a fop
Bow, to bend, or the bow
Bough, of a tree
Boy, a lad
Buoy, of an anchor
Bread, to eat
Bred, brought up
Breeches, to wear
Breaches, broken places
Bruit, a report
Brute, a beaſt
Burrow, for coneys
Borough, a corporation
By, near
Buy, with money
Brews, he breweth
Bruiſe, a hurt
Brewis, of fat and bread
Buſs, a fiſhing veſſel
Buz, the noiſe of a fly

C

Cain, that killed his brother
Cane, to walk with
Caen, in Normandy
Calais, in France

Chalice,

Chalice, a cup
Call, by name
Cawl, or ſuet
Cannon, a great gun
Canon, a rule
Canon, of a cathedral
Capital, great or chief
Capitol, a tower in Rome
Career, full ſpead
Carrier, of goods
Cellar, for liquors
Seller, that ſelleth
Cenſer, for incenſe
Cenſor, a reformer
Cenſure, to judge
Centaury, an herb
Century, an hundred years
Centry, a centinel, a ſoldier on guard
Char, a fiſh
Chair, to ſit in
Chare, a job of work
Champaine, wine of France
Campaign, a wide field, or ſummer's expedition
Choler, rage or anger
Collar, of the neck
Coller, of beef or brawn
Ceiling, of a room
Sealing, with a ſeal
Cittern, for muſic
Citron, a fruit
Choir, of a cathedral
Quire, of paper
Clerk, a clergyman
Clerk, of a pariſh
Clauſe, part of a ſentence
Claws, of a beaſt or bird
Coat, a garment
Cote, for ſheep
Comb, for the hair
Come, hither
Commit, to do
Comet, a blazing ſtar
Common, uſual
Commune, or converſe
Condemn, to death
Contemn, to deſpiſe
Council, of the king
Counſel, advice
Coarſe, not fine
Courſe, to be run
Cornhill, a ſtreet in London
Cornwall, a county
Cou'd, or could
Cud, to chew as beaſts
Current, a running ſtream
Courant, a meſſenger, or newſpaper
Currants, fruit
Crick, in the neck
Creek, of the ſea or river
Couſin, a relation
Cozen, to cheat
Cymbal, a muſical inſtrument
Symbol, a mark or ſign
Cypreſs, a tree
Cyprus, an iſland
Cruſe, for oil
Cruiſe, by the ſea-coaſt
Cygnet, a young ſwan
Signet, a ſeal

D

Dane, of Denmark
Deign, to vouchaſe
Dam, ſtopping water
Damn, to condemn
Dame, a miſtreſs
Dear, of price
Deer, in a park
Deceaſed, dead
Diſeaſed, ſick
Decent, becoming
Deſcent, going down
Diſſent, to diſagree
Deep, low in the earth
Dieppe, a town in France
Defer, to put off

Differ, to diſagree
Derbe, a city in Aſia
Derby, a town in England
Deſert, merit
Deſart, wilderneſs
Dew, a falling miſt
Due, owing
Do, to make
Doe, a female deer
Dough, paſte
Don, a Spaniſh lord
Done, acted
Dun, of colour
Dolphin, a fiſh
Dauphine, the French king's eldeſt ſon
Devices, inventions
Devizes, a town in Wiltſhire
Doer, that doth
Door, of a houſe
Dragon, a beaſt
Dragoon, a ſoldier
Draught, of drink
Drought, dryneſs
Dolour, grief or pain
Dollar, a piece of money
Demure, ſober
Demur, a ſtop or doubt

E

Ear, of the head
E'er, ever
Year, twelve months
Early, betimes
Yearly, every year
Earth, the ground
Hearth, of the chimney
Eaſter, the feſtival
Eſther, a woman's name
Enter, to go in
Inter, to bury
Elder, not the younger
Eldern, a tree
Eaten, or ſwallowed
Eaton, a town's name
Eminent, famous
Imminent, over head
Enow, in number
Enough, in quantity
Earn, to deſerve
Yarn, woolen thread
Yearn, to pity
Eaſt, the wind
Yeaſt, uſed in making bread
Envy, or hatred
Envoy, a meſſenger
Exerciſe, labour or practice
Exorciſe, to conjure
Err, to miſtake
Er, brother to Onan, ſon of Judah
Extant, in being
Extent, diſtance

F

Fain, deſirous
Feign, to diſſemble
Fair, beautiful, or a market
Fare, victuals
Faint, weary
Feint, pretence
Fourth, in number
Forth, to go out
Feed, to eat
Fee'd, rewarded
Fir, wood
Fur, or hair
Felon, a criminal
Fellon, a whitlow
File, of ſteel
Foil, put to the worſt
Fly, as a bird
Fly, an inſect
Fillip, with the finger
Philip, a man's name
Flower, of the field
Flour, meal
Floor, of a room
Follow, to come after
Fallow, ground not ploughed

Find,

find, to find any thing
fin'd, amerced
fiend, a devil
flea, off the ſkin
flea, a vermin,
flee, to eſcape
flue, of a chimney
flew, did fly
fowl, a bird
foul, dirty
Francis, a man's name
Frances, a woman's name
frays, quarrels
froiſe, pancake with bacon
frieze, a ſort of cloth
freeze, with cold

G

gall, of a beaſt
Gaul, France
garden, of herbs
guardian, an overſeer
genteel, graceful
gentile, a Heathen
gentle, mild
geſture, carriage
gler, a merry fellow
groan, with grief
grown, greater
guilt, of ſin
gilt, with gold
greater, bigger
grater, for nutmegs
grave, for the dead
greave, armour for the leg
gueſs, to imagine
gueſt, one entertained
guttonous, greedy
gutinous, ſticking as pitch
great, large
grate, for coals, &c.
greet, to ſalute
graze, to eat graſs
Grys, a town
Groat, four-pence
Grot, a cave
Galleys, ſhips with oars
Gallows, for criminals

H

Hare, in the fields
Hair, of the head
Heir, to an eſtate
Harſh, ſevere
Haſh, minced meat
Haven, a harbour
Heaven, a place of happineſs
Heart, of the body
Hart, in the woods, or an overgrown buck
Herd, of cattle
Heard, did hear
Hard, not ſoft, difficult
Here, in this place
Hear, with the ears
High, lofty
Hie, away make haſte
Hoy, a ſmall ſhip
Him, that man
Hymn, a ſpiritual ſong
Hail, congealed rain
Hale, the ſhip
Hall, in a houſe
Haul, pull
Heel, of the foot
Heal, to cure
He'll, he will
Higher, taller
Hire, wages
His, of him
Hiſs, as a ſnake, or to deride
Hole, or hollowneſs
Whole, entire
Ho! lo! to call
Hallow, to make holy
Hollow, having a cavity
Holy, pious
Wholly, entirely

Holly, a tree
Home, one's houſe
Whom, that man
Holm, holly
Hoop, for a tub
Whoop, or ho! lo!
Hugh, a man's name
Hue, of colour
Hew, with an ax

I

I, I myſelf
Eye, to ſee with
Idle, lazy
Idol, an image
I'll, I will
Ile, of a church
Iſle, an iſland
Oil, of olives
Employ, in work
Imply, to ſignify
In, within
Inn, for travellers
Incite, to ſtir up
Inſight, knowledge
Ingenious, of quick parts
Ingenuous, candid
Iron, metal
Irony, ſpeaking by contraries
Itch, a diſtemper
Hitch, to catch hold

K

Ketch, a ſhip
Catch, to lay hold of
Kill, to ſlay
Kiln, for lime
Kind, good-natured
Coin'd, money
Knave, diſhoneſt
Nave, of a wheel
Knight, by honour
Night, darkneſs
Kennel, for dogs
Channel, for water

L

Laid, placed
Lade, the water
Lane, a narrow ſtreet
Lain, did lie
Latin, a tongue
Latten, tin
Ladder to aſcend
Lather, made with ſoap
Lattice, of a window
Lettice, a woman's name
Lettuce, a ſallad
Leaſe, of a houſe
Leaſh, three
Lees, of wine
Leeſe, an old word for loſe
Leaper, that jumpeth
Leper, one leprous
Leſſen, to make leſs
Leſſon, to be read
Leaſt, ſmalleſt
Leſt, for fear
Lethargy, ſleepineſs
Liturgy, church-ſervice
Lier, in wait
Liar, that tells lies
Limb, a member
Limn, to paint
Line, length
Loin, of veal
Liquoriſh, fond of dainties
Liquorice, a plant, or its root
Low, humble
Lo! behold
Loſe, to ſuffer loſs
Looſe, to let go
Lower, to let down
Lour, a frown
Loath, to abhor
Loth, unwilling

M

Made, finiſhed
Maid, a young woman

Mai

Main, chief
Mane, of a horſe
Male, the he
Mail, armour
Manner, cuſtom
Manor, a lordſhip
Manure, to dung
Market, to buy or ſell in
Mark it, note it
Marſh, low ground
Maſh, for a horſe
Meſh, of a net
Martin, a man's name
Marten, a bird
Mead, a meadow
Mede, one of Media
Mean, of low value
Mein, carriage or aſpect
Meat, to eat
Meet, fit
Mete, to meaſure
Meſſage, buſineſs
Meſſuage, a houſe
Mews, for hawks
Muſe, to meditate
Mighty, powerful
Moiety, half
Mile, meaſure
Moil, labour
Might, ſtrength
Mite, in cheeſe
Moat, a ditch
Mote, in the ſun
Moan, to lament
Mown, cut down
More, in quantity
Moor, a black
Mower, that moweth
Moor, barren ground
Mortar, made of lime
Mortar, to pound in
Mole, vermin
Mould, to caſt in
Muſcle, a ſhell-fiſh
Muzzle, to cover the mouth

N

Nay, denial
Neigh, as a horſe
Neither, none of the two
Nether, lower
New, not old
Knew, did know
Naught, bad
Nought, nothing
Nigh, near
Nye, a man's name
Nice, curious
Niece, a brother's daughter
Not, denying
Knot, to tie
Note, mark
Note, of one's hand
Noſe, of the face
Knows, underſtands
No, a denial
Know, to underſtand
Neal, to harden glaſs
Kneel, on the knees
None, not one
Known, underſtood
News, tidings
Nooſe, a ſnare

O

Oar, of a boat
Ore, crude metal
O'er, over
Off, caſt off
Of, belonging to
Our, belonging to us
Hour, of the day
Oh! alas
Owe, in debt
One, in number
Won, at play
Own, to acknowledge
Order, rule
Ordure, dung

P

Pair, a couple
Pare, cut off
Pain, anguiſh
Pane, of glaſs
Pear, a fruit
Pattin, for a woman
Patent, a grant
Peer, a lord
Pier, of Dover
Petre, a man's name
Peter, ſalt
Pail, for water
Pale, of countenance
Pale, a fence
Pall, for a funeral
Paul, a man's name
Plait, the hair
Plate, metal
Place, room
Plaiſe, a fiſh
Parſon, of the pariſh
Perſon, any man
Pole, for hops
Poll, of the head
Pool, of water
Pore, with the eyes, or of the ſkin
Poor, neceſſitous
Palate, of the mouth
Pallet, bed
Palliate, to cover or hide
Point, a ſtop
Pint, half a quart
Poſey, a noſegay
Poeſy, poetry
Power, might
Pour, as water
Prey, a booty
Pray, to beſeech
Profit, gain
Prophet, a foreteller
Propheſy, to foretel
Prophecy, a foretelling
Practice, exerciſe
Practiſe, to exerciſe
Preſence, being here
Preſents, gifts
Princes, king's ſons
Princeſſes, king's daughters
Pleaſe, to content
Pleas, excuſes or defences
Precedent, an example
Preſident, chief
Principal, chief
Principle, the firſt rule

Q

Quire, of paper
Choir, of ſingers
Queen, the king's wife
Quean, a harlot

R

Rack, to torment
Wreck, of a ſhip
Arrack, a ſtrong liquor
Rain, water,
Reign, of the king
Rein, of a bridle
Rays, of the ſun.
Raiſe, lift up
Raiſin, a fruit
Reaſon, argument
Race, to run
Raſe, to demoliſh
Rice, grain
Riſe, to get up
Red, in colour
Read, the book
Reed, growing in the water
Relic, a remainder
Relict, a widow
Roe, of a fiſh, or a deer
Row, the boat
Right, not wrong
Rite, a ceremony
Write, with a pen
Wright, a wheelwright
Reddiſh, colour

Radiſh, a root
Rear, ſet up
Rere, behind
Arrear, of rent
Reſt, quiet
Wreſt, to pervert
Roof, the toop of an houſe
Ruff for the neck
Rough, not ſmooth
Rye, corn
Rye, a town in Suſſex
Wry, crooked
Ring the bells
Wring, the hands
Ream, of paper
Rime, a fog or miſt
Rhyme, verſe
Rind, of cheeſe
Rode, did ride
Road, the highway
Row'd, did row
Room, part of a houſe
Rome, the name of a city
Roam, to wander
Rheum, a humour
Rote, got by heart
Wrote, did write
Wrought, did work

S

Savour, taſte or ſmell
Saviour, that ſaves
Satiety, fulneſs
Society, company
Sheep, a beaſt
Ship, for the ſea
Sight, view
Cite, to ſummon
Site, ſituation
Sail, of a ſhip
Sale, of goods
Sea, the ocean
See, with the eyes
Seam, in a coat
Seem, appear
Seen, beheld
Scene, in a play
Seas, great waters
Seize, to lay hold of
Ceaſe, to leave off
Sent, did ſend
Scent, a ſmell
Shew, to make appear
Shoe, for the foot
Sink, ſink down
Cinque, five
Slight, to deſpiſe
Slight, neglected
Sleight, of hand
Shoar, a prop
Shore, the ſea-coaſt
Sewer, a common drain
Shown, viewed
Shone did ſhine
Slow, not quick
Sloe, fruit
Sow, ſeed
Sew, with a needle
Sue, at law
So, thus
Some, a part
Sum, of money
Soul, or ſpirit
Sole, a fiſh
Sole, of a ſhoe
Son, of a father
Sun, in the firmament
Sore, painful
Soar, aloft
Swore, did ſwear
Sword, a weapon
Soar'd, did ſoar
Stare, to look earneſtly at
Stair, a ſtep
Stile, to get over
Style, of writing
Sound, whole, firm; alſo noiſe
Swoon, to faint away
Soon, quickly

Statue,

Statue, an image
Statute, a law
Stature, height
Stead, a place
Steed, a horſe
Straight, not crooked
Strait, narrow
Succour, help
Sucker, a young ſprig
Spear, a weapon
Sphere, a globe

T

Then, at that time
Than, in compariſon
Tame, gentle, not wild
Thame, a town in Oxfordſhire
Tear, to rend
Tear, of the eye
Tare, an allowance in weight
Tare, a vetch
Tail, of a beaſt
Tale, a ſtory
Tiles, for the houſe
Toyles, nets
Toil, labour
There, in that place
Their, of them
Thorough, complete
Throw, as a ſtone
Throne, of the king
Thrown, as a ſtone
Tide, a flowing water
Tied, made faſt
Time, of the day
Thyme, an herb
Team, of horſes
Teem, with child
To, the prepoſition
Too, likewiſe
Two, a couple
Toe, of the foot
Tow, to draw
Tow, to be ſpun
Told, as a ſtory
Toll'd, as a bell
Tour, a journey
Tower, of a church

V

Vacation, leiſure
Vocation, a calling
Veil, a covering
Vale, between two hills
Vain, fooliſh
Vein, of the body
Vane, a weathercock
Value, worth
Valley, a vale
Vial, a glaſs
Viol, a fiddle

U

Your, of you
Ewer, a baſon
Uſe, practice
Uſe, to be wont
Ewes, ſheep

W

Wade, in the water
Weigh'd, in the ſcales
Whale, of the ſea
Wail, to lament
Waiſt, the middle
Waſte, to ſpend
Wait, to ſtay for
Weight, heavineſs
Wear, clothes
Ware, merchandize
Were, was
Where, what place
Weigh, to poiſe
Wey, five quarters
Whey, of milk
Weal, good
Wheal, from ſcourging
Wield, a ſword
Weald, of Suſſex or Kent
Wen, in the neck
When, at what time

White, of colour
Wight, an iſland
Whore, a lewd woman
Hoar, froſt
Witch, that conjures
Which, who or what
Whiſt, ſilence
Wiſt, knew
Wood, of trees
Wou'd, or would

Y

Yea, yes
Ye, yourſelves
Ewe, a ſheep
Yew, a tree
You, yourſelves
Yarn, made of wool
Yearn, to pity

Of Stops, Marks, *and* Points, *uſed in Reading and Writing; with their Places and Significations.*

THESE are of abſolute neceſſity; and great regard ought to be had to them, to avoid confuſion and miſconſtruction, and for the better underſtanding of what we read and write ourſelves; and are likewiſe of uſe to others who ſhall hear us read, or ſee our writing: They teach us to obſerve proper diſtances of time, with the neceſſary raiſing and falling of the tone or voice in reading, and the needful ſtops or marks to be uſed in writing, that we may underſtand it ourſelves, and that our meaning may not be miſunderſtood or miſapplied by others.

Stops, or pauſes, conſidered as intervals in reading, are no more than four; though there are other marks to be taken notice of, but to other purpoſes. The names of the four ſtops are a *comma*, *ſemicolon*, *colon*, and *period*, or *full-ſtop*; and theſe do bear to one another a kind of progreſſional proportion of time; for the comma ſignifies a ſtop of leiſurely telling, one, the ſemicolon, two, the colon three, and the period four.

——They are made or marked thus;

Comma (,) at the foot of a word.
Semicolon (;) a point over the comma.
Colon (:) two points.
Period (.) a ſingle point at the foot of a word.

, Example of the comma):—There is not any thing in the world, perhaps, that is more talked of, and leſs underſtood, than the buſineſs of a happy life.

; Example of the ſemicolon):—It is not a curſe that makes way for a bleſſing; the bare wiſh is an injury; the moderation of Antigonus was remarkable.

: Example of the colon):—A ſound mind is not to be ſhaken with popular applauſe: but anger is ſtartled at every accident.

. Example

. Example of the period):— it is a ſhame, ſays Fabius, for a commander to excuſe himſelf, by ſaying, I was not aware of it. A cruelty that was only fit for Marius to ſuffer Sylla to command, and Catiline to act.

By the examples foregoing, we may eaſily note that a comma is a note of a ſhort ſtay between words in the ſentence; and therefore the tenor of the voice muſt ſtill be kept up—The ſemicolon is a little longer, and the tone of the voice very little abated—The colon ſignifies perfect ſenſe, though not an end of the ſentence; and the voice a little abated, or let fall.—The period denotes perfect ſenſe, and the end of the ſentence.

? When the queſtion is aſked, there is a crooked mark made over the period thus ? and is called *a note of interrogation*. Example; What could be happier than the ſtate of mankind, when people lived without either avarice or envy? The time of pauſe for this ſtop, is the ſame with the ſemicolon.

! If a ſudden crying out, or wondering, be expreſſed, then this mark is made over the full ſtop, thus ! and called *a note of admiration* or *exclamation*. Example; Oh the aſtoniſhing wonders that are in the elementary world!

( ) If one ſentence be within another, of which it is no part, then it is placed between two ſemicircles or *parentheſis*, made thus ( ). Example; Pompey, on the other ſide (that hardly ever ſpake in public without a bluſh), had a wonderful ſweetneſs of nature. Again; Of authors be ſure to make choice of the beſt, and (as I ſaid before) to ſtick cloſe to them. Once more; Honour thy father and mother (which is the firſt commandment with promiſe), that it may be well with thee.—In reading a parentheſis, the tone muſt be ſomewhat lower, as a thing or matter that comes in by-the-bye, breaking in as it were on the main coherence of the period. The time is equal to a comma, and ought to be read pretty quick, leſt it detain the ear too long from the ſenſe of the more important matter.

' *Apoſtrophe* is a comma at the head of letters, ſignifying ſome letter or letters left out for quicker pronunciation, as I'll for I will, would'ſt for wouldeſt, ſhan't for ſhall not, ne'er for never, is't for is it, 'tis for it is, i'the for in the, o'er for over: Or to denote a genitive caſe, as my father's houſe, my uncle's wife, &c.

/ *Accent* is placed over a vowel, to denote that the ſtreſs or ſound in pronunciation is on that ſyllable.

˘ *Breve*, or a crooked mark over a vowel, ſignifies it muſt be ſounded ſhort or quick.

ʌ *Caret* ſignifies ſomething is wanting, and is placed underneath the line, juſt where any thing, omitted by miſtake or forgetfulneſs, &c. ſhould be brought in.

ʌ *Circumflex* is of the ſame ſhape with the caret, but is placed over ſome vowel, to ſhew the ſyllable to be long; as Euphrâtes.

¨ *Dialyſis*, or *Diæreſis*, or two points placed over two vowels, in a word, ſignifies they are to be parted, being no diphthong.

- *Hyphen*, or note of connection, is a ſtraight line, which being ſet at the end of a line, ſhews that the ſyllables of that word are parted, and the remainder of it is at the beginning of the next line; and ſometimes is uſed in compound words, as burnt-ſacrifices, heart-breaking, ſoul-healing, book-keeper, &c. N. B. That when you have not room to write the whole word at the end of a line, but are obliged to finiſh it at the beginning of the next, ſuch words muſt be truly divided, according to the rules of ſpelling; as, re-ſtrain, not——————reſtrain. When the hyphen is placed over a vowel, it is properly a daſh, and ſignifies the omiſſion of *m* or *n*; it is much uſed in old Latin authors, and ſometimes in Engliſh, eſpecially in law-buſineſs.

☞ *Index* is a note like a hand, pointing to ſomething very remarkable.

* *Aſteriſk*, or ſtar, directs to ſome remark in the margin, or at the foot of the page. Several of them together denote ſomething defective, or immodeſt, in that paſſage of the author.

† *Obeliſk* is a mark like a dagger, and refers to the margin, as the aſteriſk: And in dictionaries it ſignifies the word to be obſolete, or old, and out of uſe.

¶ *Paragraph* denotes a diviſion comprehending ſeveral ſentences under one head.

§ *Section* ſignifies the beginning of a new head or diſcourſe, and is uſed in ſubdividing a chapter, or book into leſſer parts or portions.

[] *Brackets*, or *crotchets*, generally include a word or ſentence explanatory of what went before: Or word's of the ſame ſenſe, which may be uſed in their ſtead.

" *Quotation*,

" *Quotation*, or double comma reverſe, is uſed at the beginning of the line, and ſhews what is quoted from an author to be his own words.

Thus much for pointing, ſtops, and marks; which, if carefully heeded and obſerved, will add grace and credit to your writing.

Of Abbreviations.

TO be ready in theſe, ſhews a dexterity in writing, and is very neceſſary for diſpatch; for by theſe we expeditiouſly expreſs, or ſet down a word, ſhortening it, by making ſome initial letter or letters, belonging to the word, to expreſs it; as in the table following:

A. for Anſwer, or After-noon
A. B. Arts Batchelor
Abp. Archbiſhop
Acct. Account
A. D. Anno Domini, Year of our Lord
A. M. Anno Mundi, Year of the world
Admrs. Adminiſtrators
A. M. Artium Magiſter, Maſter of Arts
Ana. of each a like quantity
Ap. April, or Apoſtle
Adml. Admiral
Agt. Againſt
Amt. Amount
Anab. Anabaptiſt
Aug. Auguſt
A. R. Anno Regni, in the year of the reign
Aſt. P. G. Aſtronomy Profeſſor at Greſham College
Auſt. Auſtin, or Auſtria
B. A. Bachelor of Arts
B. D. Bachelor of Divinity
B. V. Bleſſed Virgin
Bart. Baronet
Bp. Biſhop
Cant. Canticles, or Canterbury)
Cat. Catechiſm
Cha. Charles
Chap. Chapter
Cent. Centum
Ch. Church
Chanc. Chancellor
Chron. Chronicles
Capt. Captain
Clem. Clement
Col. Coloſſians
Cl. Clericus
Co. Country or Company
Col. Colonel
Comrs. Commiſſioners
Con. Conſtance or Conſtant
Conf. Confeſſor
Cor. Corinthians, or Corollary
Cr. Creditor
C. R. Carolus Rex, or Charles the King
C. C. C. Corpus Chriſti College
C. S. Cuſtos Sigilli, Keeper of the Seal
C. P. S. Cuſtos Privati Sigilli, Keeper of the Privy Seal
D. Dean, or Duke
Dan. Daniel
Dr. Doctor, or Debtor
Dea. Deacon

Do

o. Ditto, or the ſame
. Denarii, Pence
ec. or xber, or 10ber, December
evon. Devonſhire
eut. Deuteronomy
ec. deceaſed
. C. Dean of Chriſt-church
oct. Doctrine
. D. Doctor of Divinity
. Earl
arld. Earldom
dm. Edmond
dw. Edward
x. gr. Exempli gratia, for example
ngl. England
liſ. Eliſabeth
ph. Epheſians
ccl. Eccleſiaſtes
x. Exodus, or Example
v. Evangeliſt
xpl. Explanation
xpoſ. Expoſition
ſq. Eſquire
xon. Exeter
r. French or France
eb. February
a. Francis
. R. S. Fellow of the Royal Society
al. Galatians
en. Geneſis
enmo. Generaliſſimo
eo. George
. R. Georgius Rex, George the King
ar. Garriſon
en. General
ent. Gentleman
ſp. Goſpel
g. Gregory
en. Henry
amp. Hamper
Hund. Hundred
Hum. Humphrey
Heb. Hebrews
i. e. id eſt, that is
I. H. S. Jeſus Hominum Salvator, Jeſus Saviour of Men
Ibid. Ibidem, in the ſame place
Id. Idem, the ſame
Inſt. Inſtance, or inſtant
Ja. James, or Jacob
Jan. January
Jer. Jeremiah
Joſ. Jeſus
Jno. John
Judg. Judges
Iſ. Iſaac, or Iſaiah
J. D. Jurium Doctor, Doctor of Law
Joſ. Joſhua
K. King
Km. Kingdom
Kn. Knight
L. Lord
L. Liber, Book
L. Libræ, Pounds
Lieut. Lieutenant
Lp. Lordſhip
Lyp. Ladyſhip
L. L. D. Legum Doctor; Doctor of Laws
Lond. London
Lr. Letter
Lam. Lamentations
Lev. Leviticus
L. C. J. Lord Chief Juſtice
M. Marquiſs, Monday, or Morning
Mar. March
Mat. Matthew
M. Manipulus, a handful
M. A. Maſter of Arts
Maty. Majeſty
Md. Madam

Monſ. Monſieur
Math. Mathematician
Mr. Maſter
Mrs. Miſtreſs
M. D. Medicinæ Doctor, Doctor of Phyſic
M. S. Memoriæ Sacrum, Sacred to the Memory
M. S. Manuſcript
M. S. S. Manuſcripts
Mich. Michael, or Michaelmas
Min. Miniſter
N. Note
Nat. Nathaniel, or Nativity
N. B. Nota Bene, Note or Mark well
Nic Nicholas or Nicodemus
N. S. New Stile
No. Number
N. L. Non liquit, it appears not
Nov. or 9ber, November
O. Oliver
Object. Objection
Obt. Obedient
O. W. Old World
O. S. Old Stile
Oct. or 8ber, October
Oxon. Oxford
P. Paul, Paulus, Publius, or Preſident
Pugil a Handful
Pen. Penelope
Pd. Paid
Par. Pariſh
Pr. per, or by
Pat. Patience, or Patrick
Per C. Per Centum, by the Hundred
Parl. Parliament
Pet. Peter
Phil. Philippians, or Philip
Philo. Math. Philo Mathematicus, a Lover of the Mathematics
P. M. G. Profeſſor of Muſic at Greſham College
Prof. Th. G. Profeſſor of Divinity at Greſham College
Priſc. Priſcilla
Pr. Prieſt, or Prince
Pſ. Pſalm
P. S. Poſtſcript
Penult. Laſt ſave one
Q. Queen, query, or queſtion
Q. Quaſi, as it were
Q. D. Quaſi dicat, as if he ſhould ſay
Q. L. Quantum libet, as much as you pleaſe
Q. S. Quantum ſufficit, a ſufficient quantity
Qr. Quarter, or a Farthing
R. Reaſon
R. Rex, king; or, Regina, queen
Revd. Reverend
Rev. Revelation
Rich. Richard
Robt. Robert
Rog. Roger
Ret Return
Reg. Prof. Regius Profeſſor
Rom. Romans
Rt. Hon. Right Honourable
Rt. Worpl. Right Worſhipful
St. Saint
Sam. Samuel
Sect. Section
Sept or 7ber, September
Serj. Serjeant
Serv Servant
Shr. Shire
Salop Shropſhire

Sol.

l. Solution
aff. Stafford
. Spain, or Spaniſh
Semiſſis, half a pound
S. T. P. Profeſſor, or a Doctor of Divinity
ew. Steward
ho. Thomas
neſſ. Theſſalonians
ne. Theophilus
o. Tobias
Virgin, or Verſe
lt } the laſt
timus }
d. See
n. Venerable
z. Videlicet, to wit, or that is to ſay
V. gr. Verbi gratia, for example
Wm. William
Wp. Worſhip
Wpl. Worſhipful
W. R. William Rex
wn. when
Xn. Chriſtian
Xt. Chriſt
Xtopher. Chriſtopher
ye. the
yn. then
ym. them
yt. that
yr. your
&. et, and
&c. et cetera, and the reſt, or, and ſo forth.

And now having finiſhed my directions concerning ſpell-
g, pointing, &c. I ſhall proceed to give ſome inſtruc-
ns in relation to the moſt uſeful art of writing.

When any perſon has thoroughly acquainted himſelf
th ſpelling, and underſtands good Engliſh, &c. the
xt ſtep neceſſary is the acquiring of the accompliſhing
of fair writing to put this ſpelling in practice: In or-
r thereto, I ſhall endeavour to give ſuch directions, and
oper inſtructions, as may duly qualify any perſon therein.

Firſt, and principally, there muſt be a fixed deſire, and
clination imprinted in the mind for its attainment: For
myſelf had never acquired or arrived to any proficiency
it, if I had not had a ſtrong deſire and inclination to
ariſing from being convinced of its excellent uſe in
de, and all manner of buſineſs, according to the verſe:

Great was his genius, moſt ſublime his thought,
That firſt fair writing to perfection brought, &c.

Next to the deſire, there muſt be added a ſteady reſolu-
n to go through with it till it is gained; and by a
igent and indefatigable application, overcome all ſeem-
g difficulties that may ariſe in the progreſs of its at-
inment, agreeable to this diſtich:

By frequent uſe experience gains its growth:
But knowledge flies from lazineſs and ſloth.

Directions to Beginners in Writing.

FIRST it is neceſſary to be provided with the follow-ing implements, viz. Good pens, good and free ink, and alſo good paper when arrived to commendable per-formances; likewiſe a flat ruler for ſureneſs, and a roun one for diſpatch; with a leaden plummet or pencil to rule lines: Alſo gum-ſandric powder, (or pounce, a they call it) with a little cotton dipped therein, whic rub gently over the paper to make it bear ink the better; particularly, when full hands are to be written, ſuch a text, &c. and eſpecially when you are obliged to ſcrat out a word or letter; for then there will be a neceſſity fo its uſe; and rubbing the place with the pounce, ſmoot it with the haft of the penknife, or clean paper; and the you may write what is proper in the ſame place. The implements are ſummed up in theſe lines:

A penknife, razor-metal; quills good ſtore;
Gum-ſandric powder to pounce paper o'er;
Ink ſhining black; paper more white then ſnow,
Round and flat rulers on yourſelf beſtow:
With willing mind, theſe, and induſtrious hand,
Will make this art your ſervant at command.

To hold the Pen.

THE pen muſt be held ſomewhat ſloping, with th thumb and the two fingers next to it; the ball o the middle-finger muſt be placed ſtraight, juſt againſt th upper part of the cut or cradle, to keep the pen ſteady the fore-finger lying ſtraight on the middle-finger; an the thumb muſt be fixed a little higher than the end of th fore-finger bending in the joint, and the pen be ſo place as to be held eaſily without gripping. The elbow mu be drawn towards the body, but not too cloſe. You mu ſupport your hand by leaning on the table-edge, reſtin on it half-way between your wriſt and elbow, not ſuffer ing the ball, or fleſhy part of your hand, to touch th paper; but reſting your hand on the end of your littl finger, that and your fourth finger bending inwards, an ſupported on the table, as above ſaid. So fixed, and ſit ing pretty upright, not leaning your breaſt againſt th table, proceed to the making the ſmall *o*, the *a*, *e*, *i* *u*, *r*, *m*, and *x*; which muſt be all made of equal big neſs and height; the diſtance or width between the tw main

ain ſtrokes of the *n*, muſt be the ſame with the diſtance or idth of the three ſtrokes of the *m*; the ſame proportion f width muſt be obſerved in the *u*, *w*, and *o*. The let- rs with ſtems or heads muſt be of equal height; as the *d*, *f*, *h*, *k*, *l*, and *ſ*; and thoſe with tails muſt be of qual depth as the *f*, *g*, *p*, *q*, and *ſ*. The capitals muſt ear the ſame proportion one to another with reſpect to gneſs and height, as *A*, *B*, *C*, *D*, *E*, *F*, *G*, *H*, *I*, &c. his proportion of letters, both ſmall and great, muſt e obſerved in, and will ſerve for, all hands whatſoever. . B. That all upright ſtrokes and thoſe leaning to the eft hand muſt be fine or hair-ſtrokes; and all downright rokes muſt be fuller or blacker. And when you are in ining, where letters will naturally join without any raining, take not off the pen in writing eſpecially in nning or mixed hands. Care likewiſe muſt be duly ken, that there be an equal diſtance between letter and tter, and alſo between word and word; the diſtance be- ween word and word may be the ſpace that the ſmall *m* kes up; but between letter and letter not quite ſo much. it not long at writing, (that is, no longer than you mprove) eſpecially at the firſt, leſt it weary you, and ou grow tired of learning. Imitate the beſt examples, nd have a conſtant eye at your copy; and be not ambi- ious of writing faſt before you can write well; expedi- ion will naturally follow, after you have gained a habit f writing fair and free; and it is much more commend- ble to be an hour in writing ſix lines well, than to be able o write ſixty lines in the ſame time, which, perhaps, will e altogether unintelligible. And beſides, by a ſlow and air procedure you will learn in half the time; and herefore it is a vain thought in a learner, to deſire to be uick before he hath acquired experience, and a freedom of writing, by frequent practice. If you have cotton in our ink, look well that there be no hairs at the nib of our pen. Never overcharge your pen with ink; but hake what is too much into the ink again.

How to make a Pen.

THIS is gained ſooner by experience and obſerva- tion from others that can make a pen well, than by verbal directions. But *note*, That thoſe quills called ſeconds are the beſt, as being hard, long, and round in the barrel; and before you begin to cut the quill,

ſcrape off the ſuperfluous ſcurf with the back of your penknife; ſcrape moſt on the back of the quill, that the ſlit may be the finer, and without gander's teeth, (as the roughneſs in the ſlit is by ſome called). After you have ſcraped the quill as above ſaid, cut the quill at the end, half through, on the back part; and then turning up the belly, cut the other half or part quite through, viz. about a quarter, or almoſt half an inch at the end of the quill, which will then appear forked; then enter the penknife a little in the back notch, and then putting the peg of the penknife-haft (or end of another quill) into the back notch, holding your thumb pretty hard on the back of the quill, (as high as you intend the ſlit to be) with a ſudden or quick twitch force up the ſlit; it muſt be ſudden and ſmart, that the ſlit may be clearer. Then, by ſeveral cuts on each ſide, bring the quill into equal ſhape or form on both ſides; and having brought it to a fine point, place the inſide of the nib on the nail of your thumb, and enter the knife at the extremity of the nib, and cut it through a little ſloping; then, with an almoſt downright cut of the knife, cut off the nib; and then by other proper cuts, finiſh the pen, bringing it into an handſome ſhape, and proper form; but meddle not with the nib again, by giving it any trimming or fine cuts; for that cauſes a roughneſs, and ſpoils it; but if you do, to bring the nib the evener, you muſt nib it again, as above directed.

☞ *Note*, That the breadth of the nib muſt be proportioned to the breadth of the body, or downright back ſtrokes of the letters, in whatſoever hand you write, whether ſmall or text. *Note alſo*, That in your ſitting to write, you place yourſelf directly againſt a fore-right light, or elſe to have it on your left hand, (which I eſteem beſt), but by no means to have the light on your right hand, becauſe the ſhadow of your writing hand will obſtruct your ſight.

Copies in Alphabetical Order.

A

ART is gained by great labour and induſtry,
A covetous man is always, as he fancies, in want.
Add to your faith virtue, and to virtue knowledge.
A blind man's wife, they ſay, needs no painting.
A comely countenance is a ſilent commendation.

A place

1

An easy Copy for Round Hand

A B C D E F G H I K L M N

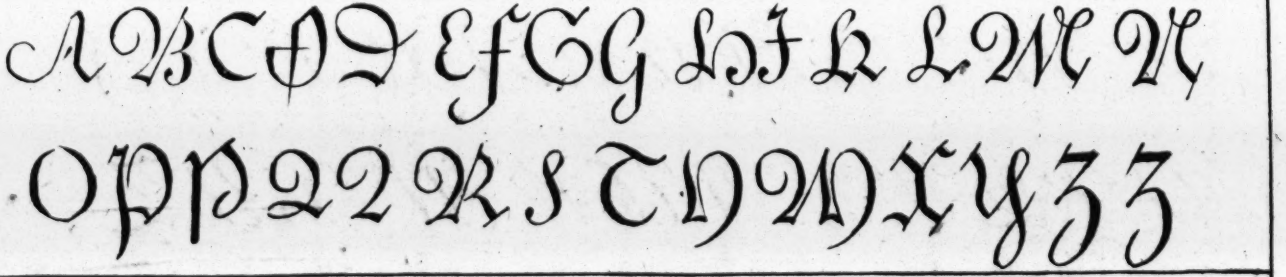
O P Q R S T U W W X Y Z

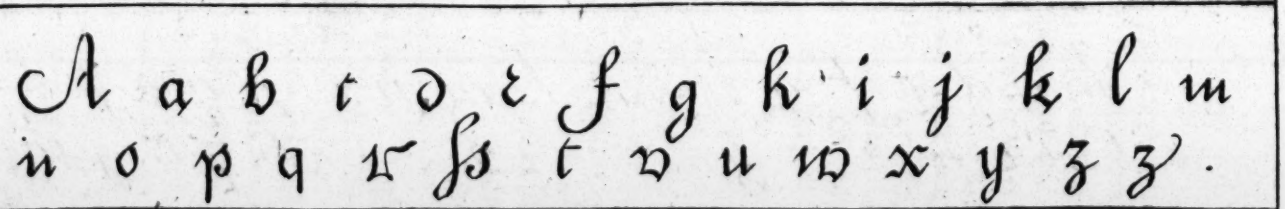
a b c d e f g h i k l m n o p q r s

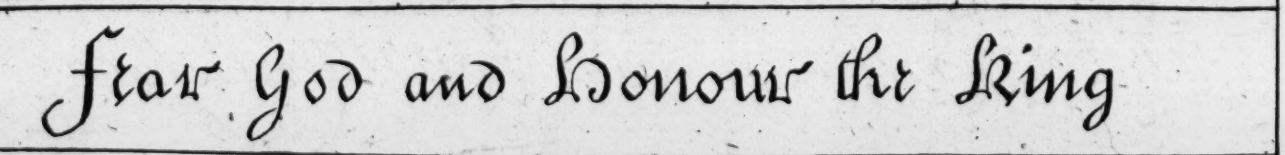
s t u v w x y z &c. 1 2 3 4 5 6 7 8 9 10.

Take great Care and you'll Write fair.

Secretary Hand







A place of ill example may endanger a good man.
A prudent man values content more than riches.
A virtuous man is rather to be choſen than promotion.
A fair piece of writing is a ſpeaking picture.
All worldly things run a continual round.
Authority is the main point in government.
All God's commandments are divinely pure.
A man's manners commonly form his fortune.
A great liar is ſeldom believed, though he ſpeaks truth.
All evil things and vain, ſtrive ever to refrain.
A virtuous-minded youth will ever love the truth.
A prudent youth and wiſe, will not advice deſpiſe.
All you that would write well, ſtrive others to excel.
Abundance ruins ſome, but want makes all to moan.
Amendment ſtill ſhould ſhine, in all and every line.
A greater loſs can't be, than that of liberty.
A good and virtuous lad, will ſhun whate'er is bad.
Affectation renders the faireſt face diſagreeable.
All idleneſs avoid, by it moſt are deſtroy'd.
All idle lazy boys obſtruct their parents joys.
A man by conduct may keep miſery away.
All miſhap hath been occaſioned by our ſin.
Avoid th' occaſion ſtill, of running into ill.
A youth that would tranſcend, muſt ever mind to mend.
A lad that would excel, muſt mind his copy well.

B

Bounty is commendable in ſome, but it ruins others.
By a commendable deportment we gain reputation.
By delight, and ſome care, we come to write fair.
By diligence and induſtry we come to preferment.
Beauty without virtue is but a painted ſepulchre.
Beauty commands ſome, but money all men.
By conſtant amendment, we riſe to perferment.
Brave men will do nothing unbecoming themſelves.
Be wiſe, and beware, of blotting take care.
Bounty is more commended than imitated.
By iniquity and ſin, misfortunes enter in.
By idleneſs and play, youth ſquander time away.
Barren are thoſe joys we waſte away in toys.
Bleſſed are their joys above, who do their time improve
Badneſs brings all ſadneſs, therefore follow goodneſs.
By truſting to-morrow, men plunge themſelves in ſorrow.
Be wiſe betimes, ſhun darling crimes.

Con-

C

Contentment is preferable to riches and honour.
Can they be counted wise, who counsel do despise?
Care mixed with delight, will bring us soon to write.
Consider the shortness of life, and certainty of death.
Contentment is a gem beyond a diadem.
Competency with content is a great happiness.
Contention and strife make uneasy our life.
Courtiers receive presents in a morning, and forget 'em by night.
Caution and care oft baffle a snare.
Contentment makes a man happy without a fortune.
Censure no man, nor detract from any man.

D

Deride not infirmities, nor triumph over injuries.
Delight, with some care, will make you write fair.
Delight in virtue's ways, and then you'll merit praise.
Death conquers potent princes, and their powers.
Delight in what you undertake to learn.
Duty, fear, and love, we owe to God above.
Death is before the old man's face, and may be at the young man's back.
Death only can declare, what dust the bodies of all mortals are.
Drinking is the drowning of cares, not the cure of them.
Death destroys not the soul, but an ill life does.
Do to others as you would that they unto you should.
Delay is the remora to all good success.
Deprive no person of his lawful due, lest they should do the same by you.
Delight and pleasure is but a golden dream.
Death is less feared by a fool than a philosopher.

E

Endless joys have those, whose sins are vanquish'd foes.
Every plant and flower shew to us God's power.
Example oft doth rule the wise man and the fool.
Examples oft prevail, when arguments do fail.
Every idle thought to judgment must be brought.
Every sluggard is the cause of his own misfortune.
Envious men do fret when they see others get.
Evil company make the good bad, and the bad worse.
Experience is the best looking-glass of wisdom.
Even at hand and feet, be sure your letters keep.
Endeavour to do well, and then you may excel.

Every

very man is right, that mixes profit with delight.
vil men and ſly, take care how you come nigh.
nvy and care make the body grow ſpare.
very money'd man hath others at command.

F

air words are often uſed to hide foul deeds.
air faces have ſometimes foul conditions.
ew do good with what they have gotten ill.
uture events muſt be left to Providence.
ools are ruled by their humour, but wiſe men by intereſt.
irm keep your mind on things that are ſublime.
ear is a good watchman, but a bad defender.
ate will ſtill have a kind chance for the brave.
raud in childhood will become knavery in manhood.
ear without hope turns to deſpair.
aith and hope are both dead when divided.
ortune is kind at ſome hours to all.
eign'd looks oft hide what the falſe heart doth know.
ortune and fame create a great name.
riends in adverſity are not often found.
ools and knaves are not companions for honeſt men.
rugality and induſtry are the hands of fortune.

G

Godlineſs with contentment is great gain.
Good manners in a lad, will make his parents glad.
Great minds and ſmall means ruin many men.
Good manners, grace, and truth, are ornaments in youth.
Good men as well as bad have ſometimes fortunes ſad.
Great good you ſure will find, if you are well inclin'd.
Good humour hath never-failing graces.
God's works only are perfect in their kind.
Gluttony would ranſack Noah's ark for the riot of a meal.
Grief nouriſhed in your breaſt, will never let you reſt.
Greater profit doth always come of learning than of play.
Great men though they ſhould, are not always good.
Good men are ſafe, when wicked ones are at odds.
Get what you get honeſtly, and uſe it frugally.
God is omnipreſent, true, and almighty.

H

Haſty reſolutions are ſeldom fortunate.
Haſte makes waſte of paper, ink, and time.
He that ſtumbles and falls not, mends his pace.
Honour and renown will the ingenious crown.
Hypocrites firſt cheat the world, and at laſt themſelves.

Human

Human life will human frailties have.
Honour that is true, 'tis lawful to purſue.
He that ſends a fool an errand, ought to follow him.
Honours are burdens, and riches have wings.
He is a wiſe ſecurity who ſecures himſelf.
He that ſins againſt conſcience, ſins with a witneſs.
Honour the hoary head, that virtue's paths doth tread.
Happy are their joys who turn away from toys.
Hours fly ſwift away, improve each moment in the day.
He that ſwims in ſin, muſt ſink in ſorrow.
He that fears not an oath, will not tremble at a lie.
He hath his work half done, that hath it well begun.

I

Inſtruction, and a good education, are a durable portion.
Ignorance is the greateſt enemy to learning.
In praiſing ſparing be, and blame moſt ſparingly.
Imaginary toys do pleaſe ſome idle boys.
Intemperance is attended by diſeaſes, and idleneſs by want.
It is good to have a friend, but bad to need him.
Idleneſs and ſloth interrupt learning's growth.
Innocency need not fear the lion, nor the rugged bear.
It is better to be unborn, than untaught.
It is too late to ſpare, when the bottom is bare.
Idleneſs hath no advocate, but many friends.
Improvement of parts is by improvement of time.
If you'd win a pen of gold, firſt learn well the pen to hold.
It is the work of an age, to repair the miſconduct of an hour.

K

Keep a cloſe mouth, if you would have a wiſe head.
Kings, as well as mean men, muſt die.
Kings may command, and ſubjects muſt obey.
Kingdoms and crowns muſt in the duſt be laid.
Knowledge ſublime is gained by much time.
Keep at a diſtance from company that's ill.
Keep good decorum in your words and deeds.
Keep cloſe your intention, for fear of prevention.
Kings may win crowns, but cannot conquer death.
Keep faith with all men, and have a care of a lie.
Keep good company, if you'd keep a good name.
Knowledge, if abuſed, is like a gem ill uſed.
Kingdoms bring care, and crowns are heavy things to wear.

Keep out evil thoughts by entertaining good ones.
Kind actions neglected make friendſhip ſuſpected.
Keep ſafe good counſel, and entertain not ill advice.
Kindle not paſſion's fire, it burns with dreadful ire.

L

Learn to live as you would wiſh to die.
Love and honour will bear no rivals.
Learn to unlearn what you have learned amiſs.
Learn now, in time of youth, to follow grace and truth.
Liberty is grateful to all, but deſtructive to any.
Lying is the duty of none, but the cuſtom of many.
Learning do but love, and then you will improve.
Liberality without diſcretion becomes profuſeneſs.
Let no jeſt intrude upon good manners.
Learn now, in youthful prime, to huſband well your time.
Liberality ſhould have no other object but the poor.
Loſt opportunities are very rarely, if ever recovered.
Let not the work of to-day be put off till to morrow.
Laugh not out of meaſure, nor out of ſeaſon.

M

Modeſty has more charms than beauty.
Monuments of learning are moſt durable.
Many know good, but do not the good they know.
Make uſe of time now whilſt you're in your prime.
Money commonly corrupts both church and ſtate.
Many think not of dying, till they can live no longer.
Many have repented talking, few of being ſilent.
Man has much to learn, but a ſhort time to live
Meaſure not goodneſs by good words only.
Marriage is out of ſeaſon, if we are either too young or too old.
Moſt precious time eſteem, which no one can redeem.
Many live beggars all their lives, that they may not die ſo.
Money makes ſome men mad, many merry, but few ſad.
Many are led by the ears more than by the underſtanding.
Moſt precious things are ſtill poſſeſs'd with fear.
Many are ma.. ſaints on earth that never reach heaven.
Malice ſeldom wants a mark to ſhoot at.
Misfortune is the touchſtone of friendſhip.
Make no friendſhip with an angry man.
Many things happen between the cup and the lip.
Mend your manners, and that will mend your fortune.

Many

Many want help that have not the face to aſk it.
Momentary and vain is all earthly gain.

N

Nothing is conſtant in this uncertain world.
Neceſſity is commonly the mother of invention.
Next to a good conſcience prefer a good name.
None ſo high can be, as no miſhap to ſee.
Nothing is ſo difficult but diligence may overcome.
No taſk is too hard, when heaven is the reward.
None can lay himſelf under an obligation to do ill.
Never lament or weep for loſs of what you cannot keep.
Noiſe or talk, without ſome rule, declare a man to be a fool.
Nature ſeldom changes with the climate,
Never ſtudy to pleaſe others, if thereby you ruin yourſelf.
Nature's eldeſt law without ſome rule, do indicate the man a fool.

O

Opportunity neglected brings ſevere repentance.
On preſent time depends our future ſtate.
Of all prodigality that of time is the worſt.
Of what gives moſt delight, we ſooneſt loſe the ſight.
Omitting to do good, is committing evil
Orators are more ſolicitous to ſpeak well than to do ſo.
Our life is here but a journey to the next world.
Our ſand doth run apace, and ſoon we end our race.
Our minds muſt be cultivated as well as our plants.
Other people's deaths ſhould be remembrancers of our own.
Our early care ſhould be to live moſt piouſly.
Our time of life is call'd a ſpan, by which obſerve how frail is man.
One vice is more expenſive then ten virtues.

P

Provide againſt the worſt, and hope for the beſt.
Poor men want many things, but covetous men all.
Patience and time run through the rougheſt day.
Put to your tongue a bridle, that it talk not idle.
Pain, diſgrace, and poverty, have frightful looks.
Prayers and provender hinder no man's journey.
Put not off the main buſineſs of life to the very article of death.
Pain we can count, but pleaſure ſteals away.
Poor freedom is better than rich ſlavery.

Purſue

Purſue uſeful and profitable ſtudies.
Paſſion and partiality govern in too many caſes.

Q

Quick promiſers are commonly ſlow performers.
Quietneſs and content are mates moſt excellent.
Qualify exorbitant paſſions with quietneſs and patience.
Quiet men have quiet minds, and enjoy content.
Quicken learning with alacrity and delight.
Quarrelſome perſons often meet with their match.
Quarrels are more eaſily begun than ended.
Quietneſs is ſecure, but raſhneſs is dangerous.
Quietly learn to bear a croſs; if we repine, 'tis to our loſs
Queſtions in jeſt no ſerious anſwers need.
Quench paſſion's heat, don't ſuffer it to reign.
Quantity with ſome is what they'd hit; but quality prevails with men of wit.

R

Remember your duty to God, your neighbour, and yourſelf.
Repentance comes too late, when all is conſumed.
Reaſon ſhould always guide, and o'er each act preſide.
Reputation ſhould be the darling of human affections.
Reſt continued long makes idleneſs grow ſtrong.
Rely on virtue more than blood.
Repent to-day, to-morrow may be too late.
Reputation is like a glaſs; when crack'd, it cannot be mended.
Reputation is gained by many actions, and loſt by one.
Remember death, and do not forget judgment.
Religion in hypocrites is but ſkin-deep.
Relations and friends purſue their own ends.
Religion is beſt underſtood when moſt practiſed.
Riches ſerve a wiſe man, and rule a fool.
Run no great riſk for 'vantage ſmall, though ſome for money hazard all.
Revenge is pleaſure only to a mean ſpirit.
Righteous men's prayers will be regarded.
Repentance is a quite forſaking ſin; but he repents not that remains therein.
Reſolve to amend and purſue 't to your end.
Review the time you have miſpent; think upon it, and lament.
Recreation ſhould fit us for buſineſs, not rob us of time

S

Sin and ſorrow are inſeparable companions.
Self-love is the greateſt flatterer in the world.
Some had rather diſcharge a reckoning than pay a debt.
Sin is the certain cauſe of misfortune.
Study to live quiet, and to do your own buſineſs.
Some in their zeal are hot, but knowledge they have not.
Set bounds to zeal by diſcretion.
Silence is the ſanctuary of prudence and diſcretion.
Sloth is an argument of a mean degenerate mind.
Short, and therefore vain, is all earthly gain.
Soft words ſometimes work upon the proudeſt heart.
Sleep and idleneſs are enemies to learning.
Sin is the cauſe of ſhame, who love it are to blame.
Short are all extremes, whether of good or ill.
Spend time in good duties, and treaſure in good works.
Some go fine and brave, finely to play the knave.
Six feet of earth end all diſtinctions of our birth.
Some muſt die, that others may live, ſaid the grave-digger.
Silly people are commonly pleas'd with filly things.
Some are full of oral ſanctity, and mental impiety.
Small profit comes from all ungodly gains.

T

Train up a child in the practice of love and good manners.
The end of mirth is many times the beginning of ſorrow.
Time is ſo ſwift, that none can overtake it.
Time paſſeth ſwift away, improve therefore each day.
The doing nothing is very near the doing evil.
Thoſe who won't mend to-day, ſhall have more work to-morrow.
The borrower is a ſlave to the lender, and the ſecurity a ſlave to both.
Truſt is the ſtrongeſt bond of human ſociety.
The endowments of the mind ought not to be confin'd.
Truth may be blamed, but cannot be aſhamed.
Truſt not too far, nor miſtruſt too ſoon.
The city cares not what the country thinks.
To do good is the way to find it.
'Tis juſt ſo much time loſt as is idly ſpent.
There is no ſuch thing in nature as perfection.
Time, tide, and carriers, will for no man ſtay.
The unfortunate are inſulted by every raſcal.
'Tis inhuman to ſport with another's infirmities.

Vanity

V

anity makes beauty contemptible.
ain and tranſitory is all wordly glory.
irtue and fortune work wonders in the world.
alue more a good conſcience than great fame.
nwillingly go to law, and willingly make an end.
nderſtanding a thing is half doing it.
ariety is the happineſs of life.
irtuous and brave actions gain reputation.
ſe ſoft words and hard arguments.
irtue is commended by all, but followed by few.
thankfulneſs is the cauſe of the earth's unfruitfulneſs.
ain conceitedneſs is ridiculed by all.
irtue is ſeldom a match for power.
nderſtand things not by their form, but quality.
irtue all commend, but few do it attend.
nion and peace make diſcord to ceaſe.
alour and greatneſs are preferred before neatneſs.
ain and fooliſh things diſreputation bring.
irtuous actions will bring reputation ſtill.

W

hat is more vain than public light to ſhun.
hat pleaſes GOD, muſt be; none alters his decree.
e are many times deceived with the bare ſhew of good.
omen and wine, though they ſmile, make men pine.
hen fortune knocks, be ſure to open the door.
ime is a turn-coat; firſt a friend, then an enemy.
hat is violent is ſeldom permanent.
hen good cheer is lacking, our friends will be packing.
iſe men keep their expences ſhort of their income.
e keep a better account of our money than our time.
ickedneſs in jeſt turns to wickedneſs in earneſt.
e muſt not blame fortune for our own faults.
here knavery is in credit, honeſty is put out of countenance.
e muſt look on time paſt, to improve what's to come.
hat is fixed in our hearts is ſeldom out of our heads.
ickedneſs comes by degrees, as well as virtue.
ould you be rich, be induſtrious; if wiſe, be ſtudious.

X

nophon was a great captain, as well as a great philoſopher.
xes wept at the thought that his vaſt army would be dead in 100 years.

Xerxes whipt the ſea, becauſe it would not obey his command.
Xenophon accounted the wiſe man happy.
Xenophilus lived without ſickneſs one hundred and seven years.
'Xamples of the beſt for ever mind, and imitate in kind.
Xerxes wept at the changeable ſtate of man.
'Xamine well how you improve, for that will be as you your learning love.
'Xerciſe will much improvement gain.
'Xperience is the miſtreſs of all arts and ſciences.
'Xcel in what you can, and ſtrive to lead the van.
'Xpreſs your deſire to learn by your diligence.

Y

Youth is full of diſorder, and age of infirmities.
Young men lament your minutes miſpent.
Your time improve, and ſquander it not away.
Your ſpelling mind, and ſenſe of what you write.
Yield quietly to what muſt come unavoidably.
Young men in ſtrength ſhould provide againſt age and weakneſs.
Youth in their prime ſhould manage well their time.
Youth to the grave do go, as well as the aged do.
Yield yourſelf ſervant to righteouſneſs unto holineſs.
Your copy mind, write fair, and of blotting beware.
Your care ſhould appear, by writing moſt fair.
Your delight and your care will make you write fair.

Z

Zeal in a good cauſe will merit applauſe.
Zeal mix'd with love is as harmleſs as a dove.
Zealouſly ſtrive with emulation to write.
Zealouſly ſtrive for an eternal crown.
Zeal without knowledge is but religious wild-fire.
Zeal, if not rightly directed, is very pernicious.
Zealouſly bend amain, fair writing to obtain.
Zeno was the firſt of the Stoic philoſophers.
Zaccheus he was low, but yet his faith wasn't ſo.

Short Lines for Text Hand.

Abandon whatſoever is ill.—Be wiſe betimes.
Care deſtroys the body.—Do the things that are juſt.
Expect to receive as you give.—Frequent good compa
Give what you give chearfully.—Have good men in ette
Imitate that which is good.—Keep God's commandme
Learn to be wiſe.—Make a right uſe of time.

Nothi

Nothing get, nothing have.—Obſerve modeſty.
Pleaſures are very ſhort.—Pains are very long.
Quit all revenge.—Quiet your paſſions.
Recompence a good turn.—Repent of your ſins.
Silence gives conſent.—Sin very little.
Time is more precious than gold.—Turn from your ſins.
Uſe moderate pleaſure.—Uſe not bad company.
Vain are ſome pleaſures.—Vice is deteſtable.
Wiſdom is the principal thing.—Wiſe men are ſcarce.
Yeſterday cannot be recalled.—You cannot take too much care.
Xenophon, Xenocrates.—Xeno and Xenobia.

Double Lines in Verſe.

All that in fair writing would excel,
How much you write regard not, but how well.
Bear your pen lightly, keep a ſteady hand,
And that's the way fair writing to command.
Carefully mend in each ſucceeding line,
For that's the way to reach to what is fine.
Deſcending ſtrokes are dark, but upward ſmall,
Even at the head and feet keep letters all.
From blots keep clean your book, and always mind
To have your letters all one way inclin'd.
Grace every letter perfect, full and ſmall,
And keep a due proportion in them all.
Hold your pen lightly, grip it not too hard,
And with due care your copy well regard.
Join every letter to its next with care,
And let your ſtrokes be admirably fair.
Keep a light hand, and ſmoothly glide along,
Aſcending fine, and downright ſtrokes are ſtrong
Let graceful beauty in each line appear,
And ſee the front doth not excel the rear.
Majeſtic grace, both beautiful and ſtrong,
Doth, or elſe ought, to every line belong.
No roughneſs at the edge ſhould e'er be ſeen,
But all the letters ſhould be ſmooth and clean.
On care depends the beauty of each line,
For that alone will make your art to ſhine.
Praiſe is deſerved by the careful hand,
But for the unthinking doth correction ſtand.
Quit yourſelf nobly with a prudent care,
Of clumſy writing, and of blots beware.

Remember ſtrictly what the art enjoins,
Equal ſiz'd letters, and as equal lines.
Small letters muſt of equal height be ſeen,
The ſame of great, both beautiful and clean.
Time and delight will eaſy make the taſk!
Delight, delight's the only thing I aſk!
Vain are the hopes of thoſe who think to gain
This noble treaſure, without taking pain.
Whilſt idle drones ſupinely dream of fame,
The induſtrious actually do get the ſame.
'Xemplar lines are writing's ſureſt law,
Precepts may lead us, but examples draw.
Youth is the time for progreſs in all arts,
Then uſe your youth to gain the nobleſt parts.
Zeal for attainment of each art will prove
One means of purchaſing the gen'ral love.

It ſhould have been obſerved, that before you proceed to joining, you be ſure to make your letters well: for which purpoſe I have here ſet copies of the moſt uſual, faſhionable, and commendable hands for buſineſs; with alphabets of great and ſmall letters proper to each. Be careful in imitation, and obſerve the foregoing directions, and without doubt you will gain your end. Command of hand, or the art of ſtriking letters, &c. is gained by frequent practiſing after good examples.

Note, It is neceſſary for all thoſe who would qualify themſelves for buſineſs often to imitate this print hand, to make clean marks on bales, or plain directions:

A B C D E F G H I J K
L M N O P Q R S T
U V W X Y Z Æ

a b c d e f g h i j k l m n o
p q r ſ s t u v w x y z &.

Since

Since good ink is neceſſary to good writing, I ſhall give a receipt or two for making ſome of the beſt black ink in the world, which is as follows, *viz.*

A Receipt for making Black Ink.

TO ſix quarts of rain or river water (but rain water is the beſt), put one pound and a half of freſh blue galls of Aleppo (for thoſe of Smyrna are not ſtrong enough) bruiſed pretty ſmall; 8 ounces of copperas, clean, rocky, and green; alſo 8 ounces of clean, bright and clear gum Arabic; and 2 ounces of roche alum: Let theſe ſtand together in a large ſtone-bottle, or clean ſtone-pot, or earthen pot, with a narrow mouth, to keep it free from duſt; ſhake, roll, or ſtir it well, once every day, and you will have excellent ink in about a month's time; and the older it grows, the better it will be for uſe

Ingredients for a Quart.

One quart of water, 4 ounces of galls, 2 ounces of copperas, and 2 ounces of gum, mixed and ſtirred as above.

If you ſoak the green peeling of walnuts (at the time of the year when pretty ripe), and oak ſaw-duſt, or ſmall chips of oak, in rain-water, and ſtir it pretty often for a fortnight; the water ſtrained off, and uſed with the ſame ingredients as above, will render the ink ſtill ſtronger and better.

How to make Red Ink.

TAKE 3 pints of ſtale beer (rather than vinegar), and 4 ounces of ground Brazil wood; ſimmer them together for an hour; then ſtrain it through a flannel, and bottle it up (well ſtopped) for uſe.

Or you may diſſolve half an ounce of gum Senega, or Arabic, in half a pint of water; then put a penny-worth of vermilion into a ſmall gallipot, and pour ſome of the gum-water to it, ſtir it well, and mix it together with a hair pencil, to a proper conſiſtency; but it will not incorporate preſently, but by the next day it will; then having a clean pen, dip it into the ink, having firſt well ſtirred it with the pencil, and then you may uſe it: It is a fine and curious red, though not ſo free as the other. And after the ſame manner you may make any other coloured ink, blue, green, yellow, purple, &c. having divers gallipots for that uſe. In like manner you may mix the

the ſhell-gold, for curious occaſions, pouring two or three drops according to direction into the ſhell, and mix it well with a clean hair-pencil, and with it put a little into a clean pen, &c. The ſmall ſhells may be bought at ſome fan-ſellers, or fan-painters, at two or three for two-pence; or the large ones (which are the beſt), at the colour-ſhops, at ſix-pence a piece.

To keep Ink *from* freezing *or* moulding.

In hard froſty weather, ink will be apt to freeze; which if once it doth, it will be good for nothing, for it takes away all its blackneſs and beauty. To prevent which (if you have not the conveniency of keeping it warm, or from the cold), put a few drops of brandy or other ſpirits into it, and it will not freeze. And to hinder its moulding, put a little ſalt therein.

Familiar Letters *on ſeveral Occaſions, and on divers Subjects.*

Before we enter upon Arithmetic, it may be proper to give ſome examples of letters on various ſubjects, and upon divers occaſions; which letters, frequently read over, and ſometimes copied, may be a good introduction to a handſome ſtyle and a commendable manner of writing; beſides the help and uſe they may be of in noting and obſerving the method of ſpelling good Engliſh, and orthographically placing great letters or capitals, where they ought to be; and alſo in imprinting in the mind the due notion of points, ſtops, &c. and when and where to be made.

Letters are variouſly worded, and ought properly to expreſs the deſires, thoughts, &c. of the writer to the reader, that thereby the receiver of the letter may fully underſtand, and be juſtly informed of the occaſions, wants or intentions of the ſender.

Letters being written on ſeveral ſubjects, and on ſundry occaſions, they may be ranked under theſe denominations or ſeveral heads following, *viz. Letters of proffered aſſiſtance, of thanks, of excuſe, reproof, of advice or counſel, of recommendation, of remonſtrance, of buſineſs and of amuſement; letters conſolatory, congratulatory, and exhortatory; alſo familiar and mixed letters, containing various ſubjects.*

I ſhall

I ſhall not have room to touch upon every one of theſe particularly; but I ſhall give fundry examples promiſcuouſly, as follows, viz.

A Letter from a Son to his Father.

Honoured Father,

AS I have not had a letter from you ſince your favour of the 8th of October laſt, which I anſwered by the next poſt, I take this opportunity of inquiring after your health, and that of my ſiſter. I have herewith ſent you, Sir, by Samuel Simple, the Pempſey carrier, a ſpaniel dog, called Tray; who is an excellent good one of his kind, and fit for the ſport of your place; is very free for the water; and if he hath any fault, it is being a little too eager; but he is young, and may be brought to what you pleaſe to have him. Pray give my love to my ſiſter, and be pleaſed to accept of my duty to yourſelf, who am,

Sir,

London, Your moſt dutiful and humble ſon,
Dec. 6, 1787. ANTHONY ADDLEHILL.

The Anſwer.

Dear Son, *Pempſey*, 28*th December*, 1787.

I Received your letter of the 6th inſtant, and thank you for inquiring after my health, which, I thank God, I perfectly enjoy at preſent, as I wiſh and hope you do yours.—I received your preſent of the dog; but the poor cur was almoſt ſtarved, having (as I ſuppoſe) had nothing on the road; but he is now in good condition, and hath been tried as to his mettle, which I find to be good. I have ſent you by the carrier half a dozen wild ducks, which Tray fetched when I had ſhot them. Your ſiſter remembers her love to you, and hath ſent you a turkey and a chine of bacon, to which I wiſh you and your friends (if you invite any) a good ſtomach. My prayers to God for your proſperity, temporal and eternal, are conſtantly offered up by

Your loving father,
ANDREW ADDLEHILL.

P. S. We have a great many wild fowl in our level, ſo that you may expect another preſent of that kind in a little time.

Note,

Note, *The letters* P S. *ſignify* Poſtſcript; *which name is given to any thing which is (like the three laſt lines in the preceding page) written below the body of a letter.*

A Letter from a young Man to his Uncle.

Honoured Uncle,

THE many kind and courteous things that you have done for me, oblige me, in point of gratitude, as well as duty (as an opportunity now offers itſelf) to make a tender to you of my poor but real and hearty ſervice, in the affair between you and Mr. A. B. of this place; and if you'll pleaſe but to communicate to me your intentions, and give your directions therein, I will execute them with all punctuality, and from time to time give you an exact account of my proceedings therein: Therefore, in expectation of your commands, I remain,

Sir,

Norwich, Your moſt obliged nephew,
Dec. 7, 1787. and very humble ſervant,

BRIAN BING.

The Uncle's Anſwer.

Nephew, *London, Dec.* 12, 1787.

I Take the offer of your ſervice in the buſineſs between me and Mr. A. B. of your city very kindly, and think none fitter to adjuſt that affair than yourſelf; but I am unwilling to go to law, and had rather, much rather, that you would endeavour to bring him to ſome reaſonable accommodation; for in ſuch conteſts the winner is commonly a loſer in the end: Therefore, if you can bring him to any reaſonable terms, I ſhall be very glad: You underſtand the affair, and I ſhall commit it wholly to your diſcreet and good management, being perſuaded you will do for me as for yourſelf; in which opinion I remain,

Your loving and affectionate uncle,

BAZIL BING.

From a Niece to her Aunt.

Madam,

THE trouble I have already given you puts me to the bluſh, when I think of intruding again on your goodneſs; but neceſſity, which frequently obliges us to ſuch actions as are contrary to our inclination, is the motive that induces me to be thus troubleſome now. Pray, dear Madam, excuſe me, if I once more beg your aſſiſtance,

ſtance, which I do not doubt but you very well know tand greatly in need of at this time; and I ſhall ever ve a grateful remembrance of your goodneſs to me; d I hope I ſhall be, one time or other, in a capacity of king ſome return for the many obligations your goodſs hath conferred upon me,

London, May 6. Your moſt reſpectful niece,
1788. and very humble ſervant.
PENELOPE PINCH.

A Letter of proffered Aſſiſtance to a Friend.

Dear Friend,

Should be falſe to true friendſhip, if I ſhould neglect or caſt off my friend in adverſity: I have heard that u are under ſome misfortune, and at preſent need my ſtance; I therefore ſend you theſe lines for your conation, deſiring you to bear up againſt your ill luck th as much preſence of mind as you can, for aſſure urſelf, I ſhall ſuddenly follow this epiſtle in pe ſon, come, I hope, opportunely enough for your aſſiſtance; which time take courage, and be aſſured you ſhall be diſappointed of timely aſſiſtance from, dear friend,

Yours in reality,
TIMOTHY TIMELY.

A Brother to a Siſter.

Dear Siſter,

MY great diſtance and long abſence from you (tho' I have not wanted good company) makes me very citous concerning your welfare; natural affection ines me ſtrongly to have you in remembrance, tendering r health and welfare in every reſpect as dear as my n: and there is nothing at my command, but if you ſt, it ſhall be freely yours. Notwithſtanding the ance, I purpoſe (God willing) to make a viſit very ly, and had done it before now, but an urgent occaterpoſed, the particulars of which being too long a letter, I ſhall acquaint you with when I ſee you. give my due reſpects to all friends, particularly to Mr. *J. B.* and ſo in expectation of finding you all at my arrival, I conclude.

London, May 7, Dear ſiſter,
1788. Your affectionate brother,
and humble ſervant,
HENRY HEARTY.

From

From a Youth at School to his Parents.

Honoured Father and Mother,

I Received your kind letter of the 4th of Novembe laſt, and alſo the ſeveral things therein mentioned by the Chicheſter carrier, for which I return you m moſt humble and hearty thanks, they coming very ſea ſonably to the relief of my neceſſities.—I endeavour t make the beſt improvement in my learning that I poſſibl can, (though at firſt it ſeemed a little irkſome and hard and I hope to gain the point at laſt for which you ſe me hither. Pray, dear parents, accept of my moſt humbl duty to yourſelves, and kind love to my brothers a ſiſters, and to my quondam *play-fellows*, particularly t *Jacky Jinglebrains*, and tell him I hope by this time h is turned a little ſerious. I am,

London, May 4, 1788.

Honoured parents,
Your dutiful ſon,
and humble ſervant,
DANIEL DILIGE

Another.

Honoured Sir,

I Am very much obliged to you for all your favour all I have to hope is, that the progreſs I make in m learning will be no diſagreeable return for the ſam Gratitude, duty and a view to future advantages, conſpire to make me fully ſenſible how much I ought labour for my own improvement, and your ſatisfactio in order to ſhew myſelf, upon all occaſions, to be

Eaton School, May 8, 1788.

Your moſt obedient ſon,
STEPHEN STUDIO

A Letter of Recommendation.

SIR,

THE bearer hereof, *Francis Faithful*, I ſend to y as one whoſe honeſty you may rely on; and experience of his conduct and fidelity gives me a cert kind of confidence in recommending him to you; for know me, Sir, and I believe you cannot in the leaſt th that I would recommend any one to you, of whoſe bity I had the leaſt ſhadow of doubt or ſuſpicion. I with due reſpect,

May 6, 1788.

Sir, your real friend,
and humble ſervant,
GEORGE GENER

A LETTER *of Thanks.*

SIR,

I Received your favour, with the kind preſent that accompanied it: I have no other way of expreſſing my gratitude at preſent, than by my hearty thanks; every thing you do has a peculiar excelleuce, and the manner of doing it is as agreeable as the action itſelf: But I muſt ſtop, leſt I ſhould offend that delicacy which I would recommend, and which is conſtantly admired by,

May 10, 1788. Sir, your moſt obliged, and moſt humble ſervant,

GEORGE GRATEFUL.

To a Country Chapman.

Mr. Francis Fair-dealer,

SIR, *London, April* 8, 1788.

YOU and I have formerly had trading together, and it is not my fault that we do not continue ſo to do; aſſure yourſelf I have a great value and reſpect for you, and on that account none ſhall be more ready to oblige you in what I may; therefore pray let us once more reſume our dealings together; and you ſhall find that, for any goods you have occaſion for in my way, none ſhall ſerve you more kindly than, Sir,

Your real friend, and humble ſervant,

TITUS TRADEWELL.

A LETTER *of Congratulation.*

SIR,

AS I am perfectly ſincere in the profeſſions of friendſhip which I have conſtantly made to you, you will certainly believe that I am ſenſibly rejoiced at your late good fortune; as your merit gave me occaſion to foreſee long before it happened, ſo I was not at all ſurpriſed in hearing thereof; I heartily wiſh you greater ſucceſs, and beg you will always continue me in the number of thoſe whom you permit to ſubſcribe themſelves, as I do now,

Sir,

London, April 2, 1788. Your moſt obedient, and moſt faithful ſervant,

RALPH REAL.

A Letter *of Enquiry of Health.*

Sir, *Hammerſmith, Oct.* 9, 1787.

NOT hearing from you in ſuch a length of time, a from the 11th of June laſt, I am concerned, leaſ ſickneſs or ſome other accident hath happened to you, o to ſome one of your family; my uneaſineſs occaſions my giving you this trouble, and I wiſh that I may find things with you better than my fears ſuggeſt: However, be pleaſed to let me know the certainty with all convenient ſpeed; thereby you'll very much oblige, Sir,

Your real friend,
and very humble ſervant,
Peter Pitiful.

A Letter *by way of Petition to a Friend.*

Honoured Sir,

I Am uncertain whether my late misfortunes have come to your knowledge; however, I moſt humbly preſume on your good-nature, being aſſured by ſundry examples of your compaſſion, that you will think of and take pity on the diſtreſſed; therefore, as an object truly deſerving compaſſion, I moſt humbly implore and petition you to conſider the many loſſes and diſappointments that I have lately met with, which have reduced me to ſuch neceſſitous circumſtances, that I cannot poſſibly proceed in my affairs. You was pleaſed once to ſtyle me your friend, and ſo I was indeed: And ſo I would moſt certainly be now, and ſhew it by a ſignal proof of kindneſs, if our circumſtances were changed, by ſtanding between you and misfortune, and ſcreening you from the contempt incident to poverty and diſtreſs. I doubt not, Sir, but your generoſity and goodneſs is as great: And I hope, with all humility, you will be pleaſed to interpoſe your good offices between ruin and,

Sir, your very humble ſervant,
Lawrence Luckleſs.

A Letter *of Friendſhip.*

Dear Friend,

IT is now a long time (as I account) ſince you and I have had any mutual converſe by letter, which to me is a great unhappineſs; and really, if diſtance did not ſomewhat excuſe, I ſhould be apt to tax you with unkindneſs

nkindneſs: but however, perhaps you may not have he ſame conveniency of writing at your place, for the want of poſtage, as we have at ours; and on that account ſhall not inſiſt on it as an infringement of friendſhip, he chief purport of this being to enquire of your well-fare, and to have an anſwer given to,

Sir,

Your real friend,
and very humble ſervant,
KENDRICK KINDLY.

A LETTER *of Buſineſs.*

SIR,

YOURS of the 25th ult. is now before me; in anſwer to which, I poſitively declare, that Mr *A. B.* hath not been with me to preſent the b l of exchange that you mention in your letter of advice to me, and therefore there can be no juſt cauſe of proteſt, or any other charge put on,

Sir,

London, May 1, 1788. Your humble ſervant,
JOHN INNOCENT.

It is as proper to know how to ſubſcribe, and how to direct, as it is to write a letter.

SUPERSCRIPTIONS.

To the King's Moſt Excellent Majeſty.
To the Queen's Moſt Excellent Majeſty,
If to a Prince, *To his Royal Highneſs*, &c.
To a Princeſs, *To her Royal Highneſs*, &c.

To Archbiſhops.

To his Grace the Lord Archbiſhop of Canterbury; or,
To the Moſt Reverend Father in God, &c.

To Biſhops.

To the Right Reverend Father in God, &c.

To Deans, Archdeacons, &c.

To the Reverend A. B. D. D. Dean of W.

To the inferior Clergy.

To the Reverend Mr A. &c. or, *To the Rev. Doctor*, &c.

To the great Officers of State.

To the Right Honourable P. Earl of H. Lord High Chancellor of Great Britain.—Lord Preſident of the Council.—Lord Privy Seal.—One of his Majeſty's Principal Secretaries of State, &c.

To Temporal Lords.

To his Grace the Duke of, &c. *To the Moſt Honourable the Marquis of* &c. *To the Right Honourable the Earl of*, &c. *To the Right Honourable the Lord Viſcount*, &c. *To the Right Honourable the Lord*, &c.

The eldeſt ſons of Dukes, Marquiſſes, and Earls enjoy by the courteſy of England, the ſecond title belonging to their father. Thus the eldeſt ſon of the Duke of *Bedford* is called Marquiſs of *Tavyſtock*; of the Duke of *Grafton*, Earl of *Euſton*; of the Earl of *Macclesfield*, Lord Viſcount *Parker*, &c. and their daughters are all called Ladies, with the addition of their Chriſtian and ſurname, thus, Lady *Caroline Ruſſel*, Lady *Auguſta Fitzroy*, Lady *Betty Parker*, &c.

The younger ſons of Dukes are in like manner called Lords; and thoſe of Marquiſſes and Earls, together with all the children of Viſcounts and Barons, *Honourable*.

To a Baronet, *Honourable*; to a Knight, *Right Worſhipful*; and to an Eſquire, *Worſhipful*.—Every Privy Counſellor, though not a nobleman, hath the title of *Right Honourable*. All Ambaſſadors have the ſtyle of *Excellency*; as hath alſo the Lord Lieutenant of Ireland and the Captain General of his Majeſty's Forces. The Lord Mayor of London, during his Mayoralty, hath the title of *Right Honourable*, and the ſheriffs, during their office, have the title of *Right Worſhipful*. All Mayors of corporations have the title of *Eſquires*, during their office.

For the beginning of Letters.

To the King; *Sir*, or, *May it pleaſe your Majeſty*.
To the Queen; *Madam*, or, *May it pleaſe your Majeſty*.
To the Prince; *Sir*, or, *May it pleaſe your Royal Highneſs*.
To the Princeſs; *Madam*, or, *May it pleaſe your Royal Highneſs*.
To a Duke; *My Lord Duke*, or, *May it pleaſe your Grace*.
To a Ducheſs; *Madam*, or, *May it pleaſe your Grace*.
To an Archbiſhop; *May it pleaſe your Grace*.
To a Marquis; *My Lord*, or, *May it pleaſe your Lordſhip*.
To a Marchioneſs; *Madam*, or, *May it pleaſe your Ladyſhip*.
To an Earl, Viſcount, or Baron; *My Lord*, or, *May it pleaſe your Lordſhip*.
To their conſorts; *Madam*, or, *May it pleaſe your Ladyſhip*.

To a Biſhop; *My Lord*, or, *May it pleaſe your Lordſhip.*
To a Knight; *Sir*, or, *May it pleaſe your Worſhip.*
To his Lady; *Madam*, or, *May it pleaſe your Ladyſhip.*
To a Mayor, Juſtice of Peace, Eſquire, &c. *Sir*, or, *May it pleaſe your Worſhip.*
To the Clergy; *Reverend Sir, Mr Dean, Mr Archdeacon, Sir*, &c. as circumſtances may require.

At ſubſcribing your name, conclude with the ſame title you began with; as, *My Lord, your Lordſhip's*, &c.

To either Houſe of Parliament, and to Commiſſioners, or bodies corporate;

To the Right Honourable the Lords Spiritual and Temporal in Parliament aſſembled.
To the Honourable the Knights, Citizens, and Burgeſſes in Parliament aſſembled.
To the Right Honourable the Lords Commiſſioners of the Treaſury or Admiralty.
To the Honourable the Commiſſioners of his Majeſty's Cuſtoms,—Revenue of the Exciſe, &c.
To the Right Worſhipful, the Governors of Chriſt's Hoſpital, London.
To the Maſter, Wardens, and Court of Aſſiſtants of the Worſhipful Company of Drapers.

Of Secret Writing.

HERE it may not be improper to ſay ſomething of Secret Writing; to which Biſhop Wilkins, in his book of Mathematical Magic, ſpeaks largely; but it is principally concerning writing in cypher, which requires great pains and an uncommon ſhare of ingenuity, both in writers and readers. But however, I ſhall ſhew two or three particular ways that are very pretty and amuſing, and alſo very eaſy, both as to coſt and pains. And,

Firſt, If you dip your pen in the juice of a lemon, or of an onion, or in your own urine, or in ſpirits of vitriol, and write on clean paper whatever you intend, it ſhall not be diſcerned till you hold it to the fire, and then it will appear legible. And if with any of the aforementioned you write on your ſkin, as on your arm and back of your hand, &c. it ſhall not be ſeen till you burn a piece of paper, and with the aſhes rub on the place, and then it will appear very plain: and this I have experienced and tried, and therefore can ſay, *Probatum eſt.*

Another way is, when you write a letter that you intend ſhall not be diſcovered, but to thoſe you think fit, firſt to write your thoughts on one ſide of your letter with black ink, as uſual, (but it ought to be on thin paper) and then on the contrary ſide, go over the ſaid matter that you would have ſecret, with a clean pen dipped in milk, and that writing ſhall not be read without holding it to the fire, as mentioned above, and then it will appear legible, in a bluiſh colour.

A third method is to have two pieces of paper of equal ſize, and the uppermoſt cut in chequered holes or ſquares big enough to contain any word of ſix or ſeven ſyllables, and in thoſe ſquares write your mind in regular ſenſe; and then take off the ſaid chequered paper and fill up the vacancies with words of any kind which will render it perfect nonſenſe, and not capable of being read to any purpoſe of intelligence: and, tranſmit and ſend the ſame uppermoſt or chequered paper, or another exactly of the ſame form, to your correſpondent; whereby he ſhall, by laying it nicely on your ſaid letter, read your intended ſenſe, without being perplexed with the words of amuſement intermixed, which makes it altogether unintelligible.

Or again, you may write to your friend in proper ſenſe with common ink, and let the lines be at ſo commodious a diſtance, that what you intended to be ſecret may be written between them with water wherein galls have been ſteeped a little time (but not long enough to tincture the water); and when dry, nothing of the writing between the ſaid lines can be ſeen; but when it is to be read, you muſt, with a fine hair-pencil dipped in copperas water, go between the ſaid lines, and ſo make it legible.

Note, This way will give no ground for ſuſpicion, becauſe the letter ſeemeth to carry proper ſenſe in thoſe lines that are ſet at ſuch a proper diſtance, &c.

Of ARITHMETIC.

AFTER writing, the next neceſſary ſtep towards qualifying a perſon for buſineſs, is the underſtanding that truly laudable and moſt excellent accompliſhment the noble ſcience of *Arithmetic*; a knowledge ſo neceſſary in all the parts of life and buſineſs, that ſcarce any thing is done without it

In my directions, I ſhall proceed with ſuch plainneſs method, and familiarity of ſtyle, as ſhall render it eaſy be underſtood, and conſpicuous to the meaneſt capacity.

And firſt of *Notation and Numeration.*

In *Notation*, we muſt note or obſerve, that all numbers e expreſſed by, or compoſed of, thoſe ten figures or haracters following, *viz.*

ne, two, three, four, five, ſix, ſeven, eight, nine, cypher.

2 3 4 5 6 7 8 9 0

Nine of theſe are called *ſignificant* figures, to diſtinuiſh them from the cypher, which of itſelf ſignifies noing; but as it is placed (in whole numbers) ſerves to ncreaſe the value of the next figure or figures that ſtand efore it; as three is but three; but before the cypher hus, 30, the three becomes thirty, &c. But in decial fractions, (0) decreaſes the value of the figure behind , for therein 3 is three-tenths of any thing, but by lacing 0 before it thus, 03, it is decreaſed from threenth parts to three-hundredth parts of any thing, &c. We re to note, That every one, or any of the above menioned nine figures, or digits, have two values; one cerain, and another uncertain; the certain value is, when t ſtands alone by itſelf; the uncertain is, when joined or placed with other figures or cyphers, for when any one f theſe figures ſtand alone, they ſignify no more than heir own ſimple value; as 5 is but five, 4 but four, 6 ut ſix, and 3 no more than three, &c. And this is the ertain value of a figure; but when another figure or ypher is annexed, they then are increaſed in their value en times, as 5, or 5 units, or ones, to 5 tens or fifty; 4 o 4 tens or forty; 6 to 6 tens or ſixty; and 3 to 3 tens or hirty; as thus, 51, fifty-one; 42, forty-two; 63, ſixty-hree; 34, thirty-four, &c. Again, if any of the ſaid figures ſtand in the third place towards the left hand, they are ſo many hundreds as they expreſſed units or ones; as 500 is five hundreds, 400 four hundreds, 600 ſix hundreds, and 300 three hundreds, &c. If any of them poſſeſs the fourth place towards the left hand, they are ſo many thouſands, as they contain units; and ſo any, or every figure increaſes by tenfold proportion from the right hand to the left, according to the place it is found or ſtands in; ſo that five may be either five or fifty; five hundred or five thouſand: In the firſt place 5; in the ſecond 50; in the third 500; and in the fourth place

5000,

5000, &c. The true value of figures in conjunction, m
be fully learned and underſtood by the following table:

The NUMERATION TABLE.

C. th. of m.	X. th. of m.	Th. of m.	C. of millions	Tens of mil.	Millions	C. of thouſ.	Ten of thouſ.	Thouſands	Hundreds	Tens	Units
12	11	10	9	8	7	6	5	4	3	2	1
1	2	3	4	5	6	7	8	9	0	1	2
	1	2	3	4	5	6	7	8	9	0	1
		1	2	3	4	5	6	7	8	9	0
			1	2	3	4	5	6	7	8	9
				1	2	3	4	5	6	7	8
					1	2	3	4	5	6	7
						1	2	3	4	5	6
							1	2	3	4	5
								1	2	3	4
									1	2	3
										1	2
											1

Th. of mil.	Millions	Thouſands	Units or ones.
123	456	789	012
12	345	678	901
1	234	567	890
	123	456	789
	12	345	678
	1	234	567
		123	456
		12	345
		1	234
			123
			12
			1

For the eaſier reading of any number, firſt get the wor
at the head of the table by heart; as units, tens, hu
dreds, thouſands, &c. and apply them thus, 75, fi
units, five; and 7 tens, ſeventy; that is, ſeventy-five
Again, 678; 8 units, eight; 7 tens, ſeventy; and
hundreds, ſix hundreds, that is, ſix hundred ſeventy
eight. Once more, 3456; ſix units ſix; 5 tens, fifty;
hundreds, four hundred; 3 thouſand, three thouſand
together, three thouſand four hundred fifty-ſix. Th
4th line of the table, viz. 123456789, may be read thu
one hundred twenty-three millions, four hundred an
fifty-ſix thouſand, ſeven hundred eighty-nine. But th
manner of reading any number may be rendered mor
intelligible by ſtops, thus: Make a comma after ever
third figure or cypher, beginning at the right hand, an
ſo on towards the left, thereby diſtinguiſhing every thir
place into hundreds, as hundreds of units, hundreds o
thouſands, hundreds of millions, and hundred thouſand
of millions, &c. And for trial, let's read the firſt lin

the table, where the laſt place in valuation is hundred ouſands of millions, and being pointed into periods, will nd thus, 123,456,789,012: and it is to be read thus, e hundred twenty-three thouſand, four hundred fifty- millions, ſeven hundred eighty-nine thouſand, (no undreds) and twelve. Again, the following number, z 276,245 678,92 ,4 0; is to be read thus, 276 mil- on of million, 245 thouſand of millions, 678 milli ns, 1 thouſands, 490 units or ones; that is, two hundred d ſeventy-ſix million of millions, two hundred and for- -five thouſands, ſix hundred ſeventy-eight millions, nine undred twenty-one thouſand, four hundred and ſixty. he foregoing Table of Numeration is on the right hand iſtinguiſhed into ſuch periods, for the eaſier reading ereof; and the like is frequently done in the public ffices, and by men of buſineſs.

NUMBERS *to be read or written*, viz.

6, *Ninety-ſix.*
42, *Two hundred forty-two.*
924, *Seven thouſand 9 hundred 24.*
4006, *Fifty-four thouſand and ſix.*
24707, *Five hundred 24 thouſand 707.*
706240, *Four millions 706 thouſand 240.*
27000472, *Sixty-two millions 700 thouſand 472.*
74960204, *Four hundred 74 millions 960 thouſand 204.*
214007042, *Four thouſand 214 millions 7 thouſand 42.*
4214800240, *Forty-four thouſand 214 million, 8 hundred thouſand 240.*

Of Numerical Letters.

Numbers were anciently expreſſed by letters; and it s neceſſary to underſtand them, for the readier reading he dates of years, frequently uſed in the title pages of ooks, on funeral monuments in Roman hiſtory, &c.

I *Signifies one.*
V *Five.*
X *Ten.*
L *Fifty.*
C *An hundred.*
CC *Two hundred.*
D or IↃ *Five hundred.*
M or CIↃ *A thouſand.*
IↃↃ *Five thouſand.*
CCIↃↃ *Ten thouſand.*
IↃↃↃ *Fifty thouſand.*
CCCCIↃↃↃↃ *An hundred thouſand.*
IↃↃↃↃↃ *Five hundred thouſand.*
CCCCCIↃↃↃↃↃ *Ten hundred*

dred thouſand, or a million.

M, DCC, LXXXVIII. *expreſſes this preſent date of* 1788, M *being one thouſand,* D *five hundred, two hundred,* LXXX *eighty-eight; together, thouſand ſeven hundred eighty-eight.*

When a letter of inferior value ſtands after one of perior, its value is to be added thereto, thus VI. VII. VIII. ſignify ſix, ſeven, and eight; but when a lette inferior value is placed before one of ſuperior, then value is to be taken therefrom, thus IV. IX. XL. XC. ſignify four, nine, forty, and ninety.

ADDITION

IS the putting together two or more numbers or ſu ſo as their total value may be diſcovered or kno

Herein we muſt always obſerve to ſet the numbers to added orderly one under the other; that is, units un units, tens under tens, hundreds under hundreds, &c. in the ſubſequent examples:

Addition of numbers of one denomination.

Yards. T.	U.	*Gallons.* H.	T.	U.	*Pounds.* X*of* Th.	Th.	H.	T.
2	4	7	5	6	5	7	9	6
4	2	4	3	2	3	9	7	4
6	8	5	9	8	6	7	2	2
8	6	6	7	6	7	9	6	7
2	4	4	2	2		2	4	9
4	2	6	7	8			3	9
2	8	6	3	5	6	2	2 4 7 4	8

In addition of ſimple numbers, whether it be yards, g luns, pounds, or any thing elſe, remember to carry 1 f every 10 that you find in the right hand row or rank figures, being units, to the next row of tens; and the li from the rank of tens to the row of hundreds, &c. a whatever it makes to the laſt row, you muſt ſet down, mount to what it will.

The numbers above are ſet down in order, as be directed; that is, units under units, tens under tens, as may be plainly underſtood. by being indicated at t head of each row or rank, by U. T. H. &c. ſignify units, tens, hundreds, &c. Then, in caſting up each amp

ble, to know its total, I begin at the right hand, or
s rank of the firſt example, and ſay, 2 and 4 is 6, and
12, and 8 is 20, and 2 is 22, and 4 is 26; in which
there are two tens and 6 over; wherefore I ſet down
ſt under its own rank, and carry two to the next row,
ſay, 2 that I carry and 4 make 6, and 2 is 8, and 8
6, and 6 is 22, and 4 is 26, and 2 is 28, and this
g the laſt row, I ſet down the amount, viz. 28; ſo
the total number of yards is found to be 286. And
amount of the next or ſecond example is found by the
e method, to be 3562 gallons. And in the third and
example, the total number of pounds is found, by the
e way, to be 247484. And ſo the total of any other
mple of the ſame kind, viz. ſimple numbers of one de-
ination, may be found. Note, That when any of the
s amounts to juſt 10, 20, 30, 40, 50, &c. then you
ſet down the 0 under its proper rank, and carry ei-
1, 2, 3, 4, or 5, according to the number of tens that
find, to the next row.

And ſo much for addition of numbers of one denomina-
, which never varies from what has been ſaid above;
rving ſtrictly to keep to the critical and nicely ſetting
n, in perpendicular order, your ſeveral numbers, that
s may preciſely and directly ſtand under units, tens
r tens, &c. as hath been fully declared before. The
t in order of courſe is addition of numbers of ſeveral de-
inations, or addition of money.

n England or Great Britain accounts are kept in
nds, ſhillings, pence, and parts of a penny; ſo you are
ote, that

4 *Farthings make* 1 *penny*,
12 *Pence* 1 *ſhilling, and*
20 *Shillings* 1 *Pound*

n adding of theſe, you are, with the ſame punctuali-
o mind, that pounds be ſet directly under pounds,
ings under ſhillings, pence under pence, and far-
gs under farthings, as in the examples thereafter
owing.

ut before you proceed, it will be neceſſary to have the
wing tables by heart, for the readier remembrance of
many ſhillings there are in a number of pence, and
many pounds are contained in a number of ſhillings, &c.
ote, that *l.* ſtands for pounds, *s.* for ſhillings, *d.* for
e, and *q.* for farthings, thoſe being the initial letters

of

of *libra*, *ſolidus*, *denarius*, and *quadrans*, *Latin* words of the ſame ſignification.

Pence.		*s.*	*d*	*s.*		*l.*	*s.*
20	is	1	8	30	is	1	10
30	is	2	6	40	is	2	0
40	is	3	4	50	is	2	10
50	is	4	2	60	is	3	0
60	is	5	0	70	is	3	10
70	is	5	10	80	is	4	0
80	is	6	8	90	is	4	10
90	is	7	6	100	is	5	0
100	is	8	4	110	is	5	10
110	is	9	2	120	is	6	0
120	is	10	0				

The uſe of theſe tables is this: Whenever you are cal ing up any ſum of money, you begin at the right han (as before in ſums of one denomination) ſuppoſe at th place of pence, then if the rank, row, or denominatio of penc amounts, from the bottom to the top, to 5 your table of pence tells you, that 50*d.* is 4*s.* 2*d* which adding 6*d.* the ſum is 4*s.* 8*d.* if to 92*d.* the tab tells you, that 90*d.* is 7*s.* 6*d.* which with 2*d.* over is 8*d.* and if to 81*d.* the table ſhews, that 80*d.* is 6*s.* and 1*d.* more makes 6*s.* 9*d.*

The *ſhillings table* ſerves to lead you to a quick rec lection how many pounds there are in ſo many ſhilling as, admit the rank of ſhillings ariſes to 57*s.* the table ſa that 50*s.* is 2*l.* 10*s.* and 7*s.* over make 2*l.* 17*s.* if to 8 the table declares, that 80*s* is juſt 4*l.* and 4*s.* over ma 4*l.* 4*s.* if to 112*s.* the table tells you, that 100*s.* is and 12*s.* more make 5*l.* 12*s.* &c.

Addition of Accounts.

Money owing, and money received, as follows:

(1)	*l.*	*s.*	*d.*		(2)	*l.*	*s.*
Owing to Mr Andrews	4	12	6	Received for	Tobacco	46	10
Mr Bent	7	6	9		Sugar	79	16
Mr Crawly	4	12	0		Indigo	42	18
Mr Dupper	6	17	7		Broad Cloth	66	12
Mr Edlin	5	6	6		Canary	90	16
Mr Franklin	4	12	3		Port wine	84	7
Mr Gregory	6	0	0		Rice	24	12
Mr Fiſher	5	15	4		Logwood	6	10
	45	2	11			496	3

I beg

I begin with the right hand rank, that is, the pence in e example of money owing, and ſay, 4 and 3 is 7, and is 13, and 7 is 20, and 9 is 29, and 6 makes 35 pence; w 30 pence, according to the table, is 2*s.* 6*d.* and 5*d.* ore makes 2*s.* 1 *d.* I ſet down 11 exactly under the nk of pence, and ſay, 2 ſhillings that I carry (which I to the rank of ſhillings) and 5 is 7, and 2 is 9 (for take firſt only the units rank of ſhillings) and 6 is 15, d 7 makes 22, and 2 is 24, and 6 is 30, and 2 makes ; and now being come to the top of the ſum, and it aking 32, I come down with the tens of ſhillings, ying, 32 and 10 is 42, and 10 is 52, and 10 is 62, and is 72, and 10 makes 82 ſhillings; and the table tell- g me that 80 ſhillings is 4 pounds, I know therefore *s.* is 4*l.* 2*s.* wherefore I ſet down the odd 2*s.* juſt under e row of ſhillings, and carry 4 pounds to the pounds, ying, 4 that I carry and 5 is 9, and 6 is 15, and 4 is 9, and 5 is 24, and 6 is 30, and 4 is 34, and 7 is 41, nd 4 makes 45 pounds: So that the total of theſe veral ſums of money, due to the ſeveral perſons, amounts 45*l.* 2*s.* 11*d.*

In the example of money received, I begin at the ght hand rank, as before, and ſay, 6 and 4 is 10, and 3 13, and 9 makes 22; and 22 pence being 1*s.* and 10*d.* ſet down 10 and carry 1*s.* to the ſhillings, ſaying, 1 at I carry and 2 is 3, and 7 is 10, and 6 is 16, and 2 18, and 8 is 26, and 6 makes 32; then I come down ith the tens, ſaying, 32 and 10 makes 42, &c. and find the bottom it comes to 102 ſhillings, which makes 5*l.* *s.* I ſet down 2*s.* and carry 5*l.* to the pounds, ſaying, that I carry and 4 is 9, &c. I find that at the top it mounts to 36; wherefore I ſet down 6 exactly under s own rank, viz. the rank of units of pounds, and car- y 3 for the 3 tens that are in 30, for at all times, in the dition of the left hand denomination, whether it be oney, weight, or meaſure, that is, in the denomination pounds tons, or yards, you muſt for every 10 carry 1 the next row, &c. ſaying, 3 that I carry and 6 is 9, nd 2 is 11, and 8 is 19, &c. and I find that at the op it comes to 49; wherefore I ſet down 49 to the left and of the 6, and the total amount of the money re- eived for thoſe particular goods or wares ſold is 496*l.* *s.* 10*d.*

More Examples for Practice.

		l.	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*
Money due from	Mr Money	17	12	6½	146	12	3½	4	10	
	Mr Gaunt	26	10	2	278	10	9	0	7	
	Mr Hern	50	0	0	46	16	6	1	0	
	Mr James	44	12	8½	100	0	0	1	1	
	Mr King	60	14	0	72	12	4	0	4	
	Mr Long	29	16	6¾	69	16	6¾	0	10	
	Mr Monk	16	10	0	460	12	6	4	4	
	Mr Napper	20	0	0	49	10	0	0	7	
	Mr Oliver	27	11	4½	7	12	4½	0		
	Mr Perkins	17	4	0	22	10	0	0	2	
	Mr Quinton	20	10	3	164	12	9	3	10	
	Mr Roper	46	16	8	75	10	6	1	10	
	Total	377	18	3	1494	16	6¾	18	0	

Addition of Avoirdupois Weight.

By this weight are weighed all kinds of *grocery* goods or wares, or goods subject to waste, as *tobacco*, *sugar*, *fruit*, and *drugs*; as also *flesh*, *butter*, *cheese*, *allum*, *tallow*, *iron*, *brass*, *copper*, *lead*, *tin*, or *pewter*, *pitch*, *tar*, *rosin*, *hemp*, *flax*, *soap*, *salt*, &c.

A table of this weight is as follows, viz.

4 Quarters make	1 dram	marked *dr.*
16 Drams	1 ounce	*oz.*
16 Ounces	1 pound	*lb.*
28 Pounds	1 qr. of a hundred weight	*qrs.*
4 Quarters	1 hundred weight	*C.*
20 Hundred weight	1 ton	*T.*

10	4	28	10	4	28	10	4	28	10	16	
C.	*qrs.*	*lb.*	*C.*	*qrs.*	*lb.*	*C.*	*qrs.*	*lb.*	*lb.*	*oz.*	
5	1	16	24	1	12	9	1	16	24	11	
4	2	24	42	2	0	4	3	26	42	14	
6	3	6	16	1	12	7	1	0	64	10	
7	1	12	25	3	24	5	3	27	29	9	
9	0	20	19	0	20	4	3	0	16	12	
6	2	0	26	1	22	2	2	2	27	13	
39	3	22	154	3	6	34	3	15	206	9	

In these examples the manner of proceeding is the same as in the former, observing that the number of units of each lesse denomination, which makes an un

the next greater, found by the preceding table, is ced above each rank of numbers; that is to ſay, in firſt example, 28, the number of pounds contained a quarter of an hundred weight, is placed over the umn of pounds; now that column, when added up, kes 78, which contains two 28s and 22 over, where- e I ſet down 22 under the column of pounds, and rry 2 to the column of quarters, and ſo on.

Note, That in weighing at the water-ſide, or elſe- ere, they do not weigh by the ton, though ſome ds are ſold by it, as *iron*, *logwood*, *cheeſe*, &c. but by hundreds, quarters, and pounds, which are after- rds reduced to and computed by tons.

Addition of Troy Weight.

By this weight are weighed *jewels*, *gold*, *ſilver*, *pearls*, *medicines*, and the uſual denominations are *pounds*, *ces*, *pennyweights*, and *grains*, as in the following table.

24 *Grains make* 1 *pennyweight*,
20 *Pennyweights* 1 *ounce*, and
12 *Ounces* 1 *pound Troy*.

Examples of Troy Weight.

ngots of ſilv. wt. viz.	10 12 20 24	12 20 24
lb. oz. pw. gr.	*lb. oz. pw. gr.*	*oz. pw. gr.*
wt. 4 5 12 10	14 6 10 11	204 10 14
5 4 16 17	24 10 11 12	96 7 17
3 11 19 20	21 6 7 17	100 11 12
4 6 7 12	22 10 12 14	56 16 20
5 1 11 12	16 11 12 13	212 10 23
4 11 12 13	21 7 6 17	96 19 12
28 6 0 12	122 5 1 12	767 17 2

f what was before ſaid be duly obſerved, the per- mance of the above examples will be attended with difficulty.

How to prove Addition.

N all additions, whether of ſimple numbers, that is, numbers of one denomination, or in examples com- ud, that is, of divers denominations, as pounds, ings, pence, and farthings, &c. the readieſt method roof is to caſt the ſame downwards, beginning at the as you did the ſame upwards, beginning at the bot-

tom, and if that operation produces the ſame total, the work is infallibly right, and beyond any contradiction; and this is much better and more ſenſible than the common method uſed in ſchools, of making two totals, by omitting the upper line in the ſecond. I might here alſo give the ſeveral examples of other additions, ſuch as apothecaries weight, cloth, liquid, dry, and long meaſure, time, &c. but the method ſerves for any of them, having reſpect to the tables belonging to thoſe ſeveral denominations, which are as follow, viz.

A Table of the Parts of Apothecaries Weight.

20 Grains 1 Scruple	8 Drachms 1 Ounce
3 Scruples 1 Drachm	12 Ounces 1 Pound

By theſe weights they compound their medicines; but they buy and ſell their drugs by avoirdupois weight.

Cloth Meaſure.

4 Nails, or 9 inches,	1 qr of a Yard.
4 qrs. or 36 inches,	1 Yard.
5 qrs. or 45 inches,	1 Ell Engliſh.
3 qrs. or 27 inches,	1 Ell Flemiſh.
6 qrs. or 54 inches,	1 Ell French.

A Table of Wool Weight.

Note, That 7 lb. make 1 Clove; 2 Cloves or 14 lb. Stone; 2 Stones, or 28 lb. 1 Todd; 6 Todds and ½, Wey, or 182 lb. 2 Weys, or 364 lb. 1 Sack; and 12 Sacks 1 Laſt, or 4368 lb.—240 lb. 1 Pack of wool.

Note, That 1 lb. 2 oz. 12 pw. troy is equal to 1 lb. avoirdupois, and a pound troy is about 13 oz. 2 dr. and avoirdupois.

A pound weight troy } of ſilv. is worth { 3 2
A pound wt. avoirdupois } { 3 15

100l. { in gold / in ſilver } weighs { 1 11¾ / 26 4 } avoird. wt.

A pound avoirdupois is heavier than a pound troy, but an ounce troy is heavier than an ounce avoirdupois.

A Table of Liquid Meaſure.

Liquid Meaſure is of two ſorts, viz. one for *wine*, *brandy*, &c. and the other for *ale* and *beer*.

Wine, &c.

8 Pints 1 Gallon	2 Hogſheads 1 Pipe or But
42 Gallons 1 Tierce	2 Pipes or Butts 1 Tun,
63 Gallons 1 Hogſhead	252 Gallons.
84 Gallons 1 Puncheon	

Note, That *ſweet oil* hath 236 gallons to the tun, but oil from Greenland hath 252 gallons to the tun.

Note, The wine gallon contains 23 cubic or ſolid inches, by which all liquids are meaſured, except beer and ale.

Beer Meaſure.

2 Pints 1 Gallon	2 Kilderkins 1 Barrel, or 36 Gallons
9 Gallons 1 Firkin	
4 Firkins 1 Kilderkin	1 Barrel and a half, or 54 Gallons, 1 Hogſhead

Ale Meaſure.

2 Pints 1 Gallon	2 Kilderkins 1 Barrel, or 32 Gallons
8 Gallons 1 Firkin of ale, ſoap or herrings	1 Barrel and a half, or 48 Gallons 1 Hogſhead
4 Firkins 1 Kilderkin	

Note, The *beer* and *ale* gallons are the ſame, viz. 282 ſolid inches; but with this difference, *i. e.* the barrel of beer contains 1228 cubic inches, or 6 gallons more than the barrel of ale.

In a Tun of Wine are	*In a Pipe or Butt are*
2 Pipes or Butts	2 Hogſheads
6 Tierces	3 Tierces
252 Gallons	126 Gallons
504 Pottles	252 Pottles
1008 Quarts	504 Quarts
2016 Pints	1008 Pints
In a Puncheon are	*In a Hogſhead are*
84 Gallons	63 Gallons
168 Pottles	126 Pottles
336 Quarts	252 Quarts
672 Pints	504 Pints
In a Barrel of Beer are	*In a Barrel of Ale are.*
2 Kilderkins	2 Kilderkins
4 Firkins	4 Firkins
36 Gallons	32 Gallons
72 Pottles	64 Pottles
144 Quarts	128 Quarts
288 Pints	256 Pints

Dry Meaſure.

2 Pints 1 Quart	Salt and ſea-coal are heaped, or elſe there are five pecks to the buſhel.
2 Quarts 1 Pottle	
2 Pottles 1 Gallon	

2 Gallons 1 Peck
4 Pecks 1 Buſhel land-meaſure
5 Pecks 1 Buſhel water-meaſure
4 Buſhels 1 comb or half quarter
2 Combs 1 Quarter
4 Quarters 1 Chalder
5 Quarters 1 Wey
2 Weys 1 Laſt or 10 qrs.
4 Fatts or Vatts, or 36 Buſhels of ſea coal, 1 Chalder; and 21 Chalders is accounted a Score in the river Thames

In the Laſt are
2 Weys
10 Quarters
80 Buſhels
320 Pecks
1280 Pottles
2560 Quarts
5120 Pints

In a Wey are
5 Quarters
40 Buſhels
160 Pecks
320 Gallons
640 Pottles
1280 Quarts
2560 Pints

Note, By an act *anno* 1712, the buſhel is 2178 cubic inches, and a gallon of this meaſure is 272¼ cubic inches.

Long Meaſure.

3 Barley-corns 1 Inch
12 Inches 1 Foot
3 Feet 1 Yard
5 Feet 9 Inches 1 Ell Eng.
5 Feet a geometrical pace
5 Yards and a half 1 Pole, Perch, or Rood
6 Feet 1 Fathom or 2 yds.
40 Poles or 220 yds. 1 furlong
8 Furlongs 1 mile, or 1760 yards
3 Miles 1 league

In a Mile are

8 Furlongs
320 Poles
1760 Yards
5280 Feet
63360 Inches
190080 Barley-corns

Land Meaſure.

5 Yards and a half, 1 pole, perch, or rood
48 Poles make 1 furlong, or quarter of an acre
160 Poles in length and 1 in breadth is 1 acre
80 Poles in length and 2 in breadth, 1 acre; and
40 Poles in length and 4 in breadth, 1 acre
4 Poles in length make 1 chain
10 Chains in length and 1 in breadth, make 1 acre.

Time.

60 Seconds 1 Minute
60 Minutes 1 Hour
24 Hours 1 Natural Day

In a Year are
31557600 Seconds

7 Days

Days 1 Week	525960 Minutes
Weeks 1 Month	8766 Hours
Months 1 Day and 6 Hours, 1 Solar Year.	365 Days 6 Hours

Note, The year is alſo divided into 12 kalendar months, ich contain 365 days, according to this good old verſe:
irty days hath September, April, June, *and* November;
bruary *hath* 28 *alone, and all the reſt have thirty-one.*

SUBTRACTION.

THE next rule in *Arithmetic* is *Subtraction* (commonly, but erroneouſly, called *Subſtraction)*, and this e teaches to take a leſſer number out of a greater, and weth the remainder, exceſs, or difference.

Place the leſſer number under the greater (with the ſame e and in the ſame order as in addition), draw a line un- them, and beginning at the right hand, take each fi- e in the lower line from the figure under which it ſtands; if the figure in the lower line is greater than that in upper, then in numbers of one denomination, ten muſt borrowed, and added to the figure in the upper line; n take the figure in the lower line from the ſum, and ite down the remainder, but for every ten thus borrow- one muſt be paid or added to the next left hand figure the lower line. *Example:* Suppoſe Mr Andrews owes Mr Baker 323*l.* whereof Mr A. hath paid to Mr B. ſum of 146*l.* in part, what remains due to Mr B?

Anſwer 177*l.*

ere the leſſer number 146 ſtands under the greater 323. d to find the remainder, or ſum remaining due, I ſay, from 3 I cannot, but 6 from 13 (for you borrow 10, d add to it the figure or cypher that ſtands directly over figure you ſubtract) and there remains 7; then 1 that borrowed and 4 is 5, for as I borrowed 10 in the in- ior place, which is equal to 1 in the ſuperior, ſo I muſt w pay the ſame; therefore I ſay, 5 from 2 I cannot, 5 from 12, borrowing 10, and adding it to the figure as above directed, and there remains 7, then 1 that I rowed and 1 is two, from the figure 3 above it, and ere remains 1, and ſo the example is done; and by it hewn that A. ſtill owes B. 177 pounds. For a proof of verity, add 177, the remainder, to 146, the leſſer of two given numbers, and it will make 323, being the

ſame

ſame with the greater number or ſum of money firſt du
and therefore is a ſure proof of the truth and certain
of the rule. And as ſubtraction is proved by additio
ſo may addition be proved by ſubtraction; for if t
two aforeſaid numbers, viz. 323 and 146, are added, the
total is 496; from which if you deduct 146, the r
mainder will be the greater number; or if you ſubtra
323 from the ſaid 496, the remainder will be 146, t
leſſer number.

All examples in *ſubtraction* of numbers of one denom
nation are performed as above, they varying not at al
But however, once more, for the better explanation, a
mit a great ſheep-maſter hath in all 6904 ſheep, a
takes out of them 2490 to diſpoſe of at market; h
many doth he leave behind? To know this, ſet the
down thus:

From 6904 the greater number,
Take 2490 the leſſer number,

Anſwer 4414

Here I ſay 0 from 4, and their remains 4; then
from nothing (or 0) I cannot, but 9 from 10 (addi
ten to the 0) and there remains 1; then 1 that I bo
rowed and 4 makes 5, and 5 from 9, and there remains
and laſtly, 2 from 6, and there remains alſo 4; (for I bo
rowed none, and therefore there is no occaſion of paying
ſo that he leaves behind him juſt 4414, which put to t
number he takes to market, makes the number he fi
had, viz. 6904, and ſhews the deduction to be true, a
the anſwer right.

More Examples for Practice.

	l.	*Yards*	*Gallons.*	*Pou*
From	4796	3700	47200	479
Take	2929	1976	31976	97
Rem.	1867	1724	15224	381
Proof	4796	3700	47200	479

The diſtance of time ſince any remarkable event m
be found by ſubtracting the date thereof from the c
of the preſent year.

Exam

Examples.

1788 II. 1788
1666 the fire of London. 1588 the Spanish invasion.

ce 122 years. Since 200 years

III. 1788
1605 gunpowder treason.

Since 183 years.

Subtraction of divers Denominations.

Here, if the figure or figures placed in the lower line ceed those in the upper, then as many units must be rrowed as make an unit, or one, of the next superior nomination, and one must be carried to the next left-nd place in the lower line, as before.

Of Money.

	l.	*s.*	*d*	
ue	9	2	6	Suppose Mr Champion owes Mr Darnel 9*l.* 2*s.* 6*d.* and Mr C. hath
id	6	16	4	paid Mr D. in part 6*l.* 16*s.* 4*d.*;
				what remains due to Mr D.? *Ans.*
sts due	2	6	2	there is due to Mr Darnel 2*l.* 6*s.* 2*d.*
	10	20	12	4
	l.	*s.*	*d.*	Again, Mr Edwards sells to Mr Francis, Spanish wool
ld for	242	16	3	$\frac{3}{4}$ to the value of 242*l.* 16*s.*
id in part	174	12	6	$\frac{1}{2}$ 3*d.* $\frac{1}{4}$, and pays present mo-
				ney, the sum of 174*l.* 12*s.*
nswer.	68	3	9	$\frac{1}{4}$ 6*d.* $\frac{1}{4}$; what money remains unpaid from Mr Francis?
				Answer, 68*l.* 3*s.* 9*d.* $\frac{1}{4}$

In the first of these examples, I say, 4*d.* from 6*d.* and ere remains 2*d.* then 16*s.* from 2*s.* I cannot, but bor-wing one integer of the next denomination, or 1 pound hich is 20*s.* I say, 16 from 20 and there remains 4, and dding to it the number 2, it makes 6; wherefore I put own 6 in the place of shillings, and say, 1 that I bor-wed, and 6 is 7: Now 7*l.* from 9*l.* there remains 2*l.* the money resting due to Mr Darnel is 2*l.* 6*s.* and 2*d.* in the example.

In the second example, I say, 2 farthings (or an half-enny) from 3 farthings, and there remains 1, which I t down in its proper place, viz. under the denomina-ons of farthings; then 6 from 3 I cannot, but 6 from 2 (as marked over the denomination) and there remains 6, and

6, and 3*d.* over it makes 9*d.* which I place under the line in its right place, viz. of pence; then 1 that I borrowed (that is 1 ſhilling) and 12 is 13: 13*s.* from 16 and there reſts 3, which I likewiſe ſet down under its own rank; then 4 from 2 I cannot, but 4 from 12 (borrowing 10) and there reſts 8; then 1 that I borrowed and 7 makes 8; 8 from 4 I cannot, but 8 from 14, and there remains 6; ſo that the ſum remaining due is 68*l.* 3*s.* 9*d.* ¼ as in the work. For its proof, you muſt add the remainder 68*l.* 3*s.* 9*d.* ¼ to the leſſer or under ſum 174*l.* 12*s.* 6*d.* ¾ and it makes 242*l.* 16*s.* 3*d.* ½ the ſum firſt due, and is a proof of the work's being right.

More Examples for Practice.

	10	20	12	4
	l.	*s.*	*d.*	
Due	174	16	6	¾
Paid	97	12	4	¾
Remain	77	4	1	½
Proof	174	16	6	¾

	10	20	12
	l.	*s.*	*d.*
Due	74	10	4
Paid	29	12	9
Remain	44	17	7
Proof	74	10	4

	10	20	12
	l.	*s.*	*d.*
Due	2741	7	0
Paid	1976	16	6
Remain	494	10	5
Proof	2471	7	0

	10	20	12
1ſt Due	74	0	0
Paid	46	12	10
Bal.	27	7	2
Proof	74	0	0

	10	20	12
1ſt Due	274	16	6
Paid	197	19	4
Bal.	76	17	2
Proof	274	16	6

	10	20	12
1ſt Due	796	0	0
Paid	279	11	7
Bal.	516	8	5
Proof	796	0	0

Sometimes a ſum owing may be paid at ſeveral times; then the ſeveral payments muſt be added together, and their total deducted from the ſum firſt due, as in this and the examples following:

Owing 266*l.*

Paid at times { 20, 15, 30, 90, 17, 24, 60 }

Paid in all 256 deduct.

Reſts due 10

Proof 266

More

	l.	*s.*	*d.*		*l.*	*s.*	*d.*
More due	249	12	0	Received	100	10	0
	14	12	6		6	16	0
	9	14	9		10	0	0
	20	0	0		5	12	6
Rec. at several times	16	16	6	Paid to several persons	20	10	0
	22	10	2		7	9	6
	13	12	6		9	8	6
	7	16	4		7	12	6
Rec. in all	115	8	9	Paid in all	67	9	0
Rests due	134	9	3	Remains in the bag	33	1	0
Proof	249	12	0		100	10	0

Avoirdupois Weight.

	10	20	4	28		10	4	28		12	16	16
	Tons.	C.	*qrs.*	*lb.*		C.	*qrs.*	*lb.*		*lb.*	*oz.*	*dr.*
From	44	12	1	10		246	2	12		146	2	10
Take	39	14	2	6		164	3	22		97	10	12
	4	17	3	4		81	2	18		48	7	14
Proof	44	12	1	10		246	2	12		146	2	10

Troy Weight.

	10	12	20	24	10	20	24	
	lb.	*oz.*	*pwt.*	*gr.*	*oz.*	*pwt.*	*gr.*	
From	462	4	10	11	1247	10	12	
Take	196	9	6	16	976	16	17	
Remain	265	7	3	19	270	13	19	
Proof	462	4	10	11	1247	10	12	

nd so much for Subtraction; which method will for any denominati n whatever having respect to several tables of quantity, as before hinted in Adj n.

MUL:

MULTIPLICATION.

THE next rule in order is Multiplication, and p haps the moſt ſerviceable rule in buſineſs, for quick diſpatch, of all others in arithmetic; which ſhall endeavour to ſhew by its nature, quality, and Now,

1. Multiplication is a rule, that, by two numbers giv teacheth to find out a third, which ſhall contain eith of the two as many times as the other containeth unit.

2. Multiplication is alſo a compendious working Addition.

3. It likewiſe ſerves to bring great denominations to ſmall, as pounds into ſhillings, pence into farthings.

4. Having the length and breadth of a plain ſurfa we find its content in ſuperficial or ſquare meaſure.

5. By Multiplication we find, having the value of thing, or the wages of one perſon, how to know value of many ſuch things, or the wages of many perſons.

In Multiplication we are particularly to take notice theſe terms, viz.

The { *Multiplicand*, *Multiplier*, and *Product*.

1. The Multiplicand (generally the greater of two numbers) is the number to be multiplied.

2. The Multiplier (generally the leſſer of the numbers) is the number by which the former, is to multiplied.

3. The Product is the reſult of the work, or anſ

The multiplier and multiplicand are collectively ca Factors.

But before any procedure can be made in this rule, is neceſſary to have the following table by heart, that very perfectly:



MULTIPLICATION TABLE.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

This table is ſo plain and eaſy, that there is no need direction; for the product of any two figures will be nd in that ſquare, which is on a line with the one, under the other; thus, 54, the product of 6 and will be found on a line with 6, and under 9, or on a with 9, and under 6; ſo 7 times 8 is 56, and 8 s 7 is 56, &c. And thus the table ought to be got heart, for the more dextrous readineſs in multiplying.

Now for Application.

Example 1. How many are 3 times 472? Which g ſet down in the margin, I ſay, 3 times 2 is hich place under 3 the multiplier; then 3 s 7 is 21; ſet down 1 under 7, and carry 2 the two tens, as in addition of one denomina-

472
3
1416

tion; then 3 times 4 is 12, and 2 carried is 14; wh
ſet down, and the product is 1416; that is 3 times 4
makes ſo much; which may be proved by addition,
ſetting down 472 three times, in additional order,
caſting it up; which makes the aſſertion good in the
cond definition, that this rule compendiouſly perfor
the office of addition. Likewiſe the foregoing ex
ple agrees with the firſt definition; for as three ti
472 make 1416, ſo doth 472 times 3 make the ſa
viz. 1416.

Example 2. Again, how many are produced by m
plying 742 by 4?

742 Multiplicand
4 Multiplier
2968 Product

Here I ſay, 4 times 2 is 8,
4 times 4 is 16, 6 and carry 1;
4 times 7 is 28, and 1 is 29, wh
ſet down, ſo the whole produc
2968, as appears by the work.

More examples of one figure in the multiplier
theſe, viz.

Multiplic.	7420	4444	7460	90704	56789
Multiplier	5	6	7	8	9
Product	37100	26664	52220	725632	511101

Compound Multiplication

Is when the multiplier conſiſts of two, three, four,
more figures or cyphers.

And here you muſt begin with that figure which i
the place of units of the multiplier, and go through
whole multiplicand, by multiplying each figure of it
that ſaid unit figure, then by the next, to wit, by
figure in the place of tens of the multiplier; then with
third, &c. to the laſt; always remembering to place
firſt figure of every product or line, (for you will
have as many as you have ſignificant figures in
multiplier) I ſay, remember to place the firſt figure
each line exactly and perpendicularly under the figure
multiply by; and then add the ſeveral lines or prod
together, which ſo collected give the total product
quired, as in the examples following, viz.

Exa

Example 1.

How many are 23 times 7426? First I begin h the unit figure 3 in the multiplier, ſaying imes 6 is 18; 8 (which I ſet directly under 3 which I multiply) and carry 1; then 3 es 2 is 6, and 1 is 7; then three times 4 is ; 2 and carry 1; then 3 times 7 is 21, and 1 2; and ſo I have done with the firſt figure the multiplier, viz. 3. Then I go to the next, t is 2, and twice 6 is 12; 2 and I carry 1, (which two laced in a direct line under 2, the multiplying figure) n twice 2 is 4, and 1 is 5; then twice 4 is 8; and ly, twice 7 is 14, which I ſet down; then I add the products together, ſaying, 8 is 8, &c. and the total the true product or reſult of the multiplication, viz. 0798.

	7426
	23
	22278
	14852
	170798

Example 2.

What is the product of - - - 527527
multiplied by 285

	2637635
	4220216
	1055054
	150345195

t will appear too prolix, and altogether eceſſary, to give more verbal directions; , indeed nauſeous tautology, ſince thoſe n above are ſufficient; and therefore learner is referred to the obſervation of example, as alſo to thoſe two that fol- , viz.

527535	275827
15728	19725
4220280	1379135
1055070	551654
3692745	1930789
2637675	2482443
527535	275827
8297070480	5440687575

When cyphers are intermixed with figures in the tiplier, then multiply by the figures as above; and n you come to a cypher in the multiplier, then ſet n another cypher exactly and perpendicularly under hen begin the multiplicand again with the next figure he cypher in the multiplier, and go through it in the

ſame line, placing the firſt figure of that product next to the cypher towards the left hand; but then heed muſt be taken that the next figure or cypher of the next line muſt be ſet down one degree farther towards the left hand, and not immediately under the laſt figure ſet down to the cypher; as in the following examples may be fully underſtood:

24393	7864371	327586
402	23604	6030
48786	31457484	9827580
9757 20	471862260	19655160
9805986	23593113	197534358 0
	15728742	
	185630613084	

When you have a cypher or cyphers in the multiplier at the beginning towards the right hand, then ſet it or them backwards from the place of units towards the right hand: And when you have multiplied by the figure or figures, annex the cypher or cyphers:

As in theſe Examples,

4762	47962	4632
70	400	2600
333340	19184800	27792
		9264
		12043200

If you have cyphers both in the multiplicand and multiplier; then neglect the cyphers in both, and multiply by the figures, and annex the cyphers at laſt:

As in theſe Examples,

42600	42300	376400
220	12000	2400
852	846	15056
852	423	7528
93720 00	507600000	903360000

When you are to multiply by 10, 100, 1000, 10,000 it is only adding or annexing ſo many cyphers to the multiplicand, that is, either 1, 2, 3, or 4 cyphers, and the work is done. *Example,* Suppoſe I am to multiply 375 by

5 by the numbers above; if I multiply it by 10, then
oin 0 to 375, and then it makes, or the product is
50; if by 100, then I annex 00, and then it makes
500; if by 1000, I put to it 000, and then it pro-
ces 375 000; and laſtly, if by 10,000, I then add to
0000, and then it makes 3750000, &c. And thus
y any number be multiplied, when the multiplier con-
s of an unit with any number of cyphers, and done by
ſpection only, without any formal ſetting down the
ltiplicand with a line drawn under it, &c.

Thus far for direction in the manner how to multiply;
e next will be to ſhew the uſes of multiplication in real
ineſs, and how to apply it on proper occaſions, viz.

. Suppoſe you want to know how many half-crowns
re are in 246*l.* you know that 8 half-crowns make 1*l.*
erefore ſet them down thus:

246*l.*
Multiply by 8

Anſwer 1968

Again, in 1968 half-crowns, how many pence?
30 pence in half-a-crown.

59040 pence, the anſwer.

nd this ſerves to make out, that great denominations
brought into ſmaller by this rule, according to the
d definition.

. Admit you wanted to know the contents of a large
ſſe-board table, 34 feet long, and 4 feet wide, multi-
34 the length, by 4 the breadth, and the anſwer will
136 ſquare feet for the true contents of ſuch a table.
d this agrees with 4th definition of this rule.

. If I know the value of a yard of broad-cloth to be
hillings, what is the value of 220 yards of the ſaid
h in ſhillings?

220
Multiply by 12

440
220

Anſwer 2640 ſhillings, or 132 pounds.

If the wages of 1 ſeaman be 23 ſhillings a month, what is the wages of 250 ſeamen for the ſame time?

Multiply by 23

750
500

Anſwer 5750 ſhillings, or 287*l.* 10*s.*

And theſe two examples accord with the fifth definition, or uſe of this rule.

And thus much for common multiplication.

I ſhall, in the next place, ſay ſome ſmall matter concerning multiplication of money, and a little of its uſe, and ſo conclude this rule.

Multiplication of Money.

Multiplication of money (what moſt would learn above any thing) hath great affinity with addition of money; the ſame method being taken in carrying from one denomination to the next, viz. from farthings to pence, from pence to ſhillings, and from ſhillings to pounds. And as in addition (and other multiplications) you begin at the right hand, and proceed towards the left; ſo here you begin at the leaſt denomination, which is alſo at the right hand.

This method of accounting is the moſt apt and expeditious of all others, for ſmall quantities; and therefore extremely neceſſary in making bills of parcels, &c. as is, beyond all contradiction, as ſure and certain as any way whatſoever.

The general rule

Is always to multiply the price by the quantity.

The firſt ſtep is, for quantities from 2 to 12; and this is done by one multiplier; as in the examples following.

Example 1.

	l.	*s.*
Multiply	7	12

(for 6 pieces of cloth at 7*l.* 12*s.* 6*d.* per piece) by

45 15

Here I ſay 6 times 6 is 36 pence, which is juſt 3*s.* ſet down 0 in the place of pence, and carry 3*s.* to the place of ſhillings, (exactly the ſame as in addition of money) then 6 times 12 is 72, and three is 75*s.* or 3*l.* 15 wherefo

erefore I ſet down 15 in the place of ſhillings, and car- 3 to the pounds; then 6 times 7 is 42, and 3 is 45*l.* the whole amount of the ſix cloths, at 7*l.* 12*s.* 6*d.* per oth, is 45*l.* 15*s.* as in the work, which is very conciſe.

Example 2.

Again, how much is 9 times 13*s.* 4*d.* or what is the mount of 9 marks?

In this example I ſay 9 times 4 is 36*d.* or 3*s.* I ſet down 0, and carry 3; then

	9.	
6.	0	0

times 3 is 27, and 3 makes 30; I ſet down 0, and car- y 3 (as in multiplication of ſimple numbers); then 9 times is 9, and 3 is 12, which is in the place of tens of ſhil- ings, and being halved, make juſt 6*l.* and ſo much is the alue of 9 marks.

Example 3.

Once more; What comes 12 gallons of wine to at 5*s.* 4*d.* per gallon?

Here I ſay, 12 times 4 is 48, 0 and carry 4; then 12 times 5 is 60, and 4. is 64*s.* or 3*l.* 4*s.*

	s.	*d.*
	5	4
		12
£. 3	4	0

The next degree or ſtep of advance in this way of reckoning, is of quantities exceeding 12, even to 12 times 12, or 144; all which, as far as 144, are found in that excellent table, the table of multiplication; which is a ready help to all purpoſes of reckoning, and particularly in this way; and that you may proceed with dexterity, you muſt be very ready in the ſaid table, that you may be immediately apprehenſive what component parts hit your quantity propoſed, or pretty near it, (for any quantity below 12 needs no recollection at all, as in two of the examples foregoing) and then work accordingly; if the quantity be 15 yards, I readily know that 3 times 5 is 15; and therefore 3 and 5, or 5 and 3, are to be my multipliers; if the quantity were 21, then 3 and 7, or 7 and 3 would be multipliers; if 30, then 5 and 6, or 6 and 5; alſo 3 and 10, or 10 and 3; if 45, 48, 56, 66, 72, 96, &c. were the quantities, then 5 and 9, 6 and 8, 7 and 8, 6 and 11, 6 and 12, and 8 and 12, &c. are to be multipliers, and exactly hit the ſeveral quantities of which they are component parts, and ex-

amples

amples of this kind have two multiplications for their ſolution.

When the quantity propoſed is a number irregular, or ſuch a number that no two numbers in the table can be found to anſwer it, then we muſt multiply by two ſuch numbers as come pretty near it, as is ſaid above; and for the number wanting, to make up the number or quantity propoſed, multiply the given price of one by the number that is wanting, which will make three products by three multiplications; which laſt product muſt be added to the foregoing products reſulting from two multiplications, and the total will be the anſwer.

And firſt, I ſhall ſhew examples of the ſecond ſtep, viz. of regular quantities that exceed 12, and are preciſely anſwered at two multiplications, ſuch as mentioned above, viz.

What comes 15 yards of muſlin to at 3 *s.* 5 *d.* per yard?

Here 3 times 5 is 15*d.* or 1*s.* 3*d.* 3 and carry 1*s.* then 3 times 3 is 9, and 1 is 10*s.* ſo the firſt product is 10*s.* 3*d.* which I multiply by 5, ſaying 5 times 3 is 15*d.* or 1*s.* 3*d.* 3 and carry 1; then 5 times 10 is 50, and 1 is 51*s.* or 2*l.* 11*s.* So the amount of 15 yards, at 3*s.* 5*d.* per yard, is 2*l.* 11*s.* 3*d.* And demonſtrable thus, viz. If 10*s.* 3*d.* be the value of three times 3*s.* 5*d.* then 5 times the value of 10*s.* 3*d.* muſt of neceſſity be 15 times the value of 3*s.* 5*d.* becauſe 5 times 3 is 15; And its truth may be proved by addition and multiplication, thus: Set down 3*s.* 5*d.* three times, in additional order, and put the three lines together, and the total of them multiply by 5, as before, and the anſwer will be the ſame. Or ſet down 17*s.* 1*d.* (the product of 3*s.* 5*d.* multiplied by 5) three times alſo, and add them together, and the total will be exactly the ſame with the reſult by multiplication: As in the following ſpecimens of work:

	s.	*d.*	
	3	5	
			3 and 5
	10	3	
			5
	2	11	3

(1)

(1)

s.	*d.*
3	5
3	5
3	5
10	3
	5
2	11 3

(2)

s.	*d.*
3	5
	5
17	1

s.	*d.*
17	1
17	1
17	1
2	11 3

Here the first of these two proofs is worked by addition and multiplication, and the second by multiplication (as per margin) and addition. Also,

By this we see, that in all examples under this head, we are to pitch upon two numbers (for multipliers) in the table; which multiplied together, make the quantity proposed; and then we are to multiply the price by one of the numbers, (it matters not by which first) and then that product is to be multiplied by the other number, and the second or last product will be the answer.

Example 2.

Again what is the value of 21 gallons of brandy

s.	*d.*	
7	9	per gallon?
	7	and 3
2	14	3
		3
8	2	9

In this example I say, 7 times 9 is 63*d.* or 5*s.* 3*d.* I set down 3 and carry 5; then 7 times 7 is 49, and 5 is 54*s.* or 2*l.* 14*s.* So the first product is 2*l.* 14*s.* 3*d.* which I multiply by 3, and that produces the last product or answer, viz. 8*l.* 2*s.* 9*d.*

Now follow a few more examples of this sort, without any verbal directions, because I think those already given may be sufficient.

Example 3.

What comes 30 ells of Holland to, at *s.* *d.* 3 7 per ell?

	10	and 3
1	15	10
		9
Ans. 5	7	6

Example 4.

45 pound of raw silk, at 15*s.* 6*d.* per lb.

	5	and 9
3	17	6
		9
Ans. 34	17	6

Example

Example 5.

56 bushels of wheat,

	s.	d.	
at	4	9	
			7 and 8
1	13	3	
			8
Anſ. 13	6	0	

Example 6.

72 broad pieces,

	s.	d.	
at	23	6	
			12 and 6
14	2	0	
			6
Anſ. 84	12	0	

Example 7.

108 lb. of Indigo Labor

	s.	d.	
at	7	8	
			9 and 1
3	9	0	
			12
Anſ. 41	8	0	

Example 8.

96 cwt. of currants,

	l.	s.	d.	
at	2	13	6	per cwt.
			8	and 12
21	8	0		
			12	
Anſ. 256	16	0		

The next gradation of advance is of quantities irregular, or of numbers that are not to be anſwered preciſely at two multiplications: In this caſe there ariſeth no increaſe of difficulty, but it is as eaſy as the example foregoing; only here you will have an addition of one line more, occaſioned by bringing down the price of one to be added to the laſt product; or elſe a line more made by multiplying the price by what is defective or wanting in the number by two multiplications, to make up the propoſed quantity complete; as it may be of 2, 3, 4, 5, &c. as by the ſubſequent examples may be ſeen and underſtood:

Example 1. What is the product of *2l.* 13*s.* 6*d.* multiplied by 39?

l. 2	13	6	
		6	and 6
16	1	0	
		6	
96	6	0	
8	0	6	
104	6	6	*Anſ.*

Here I find that 6 multiplied by 6 makes 36; which is within 3 of the quantity propoſed; wherefore I multiply by 6, and that product again by the other 6; the laſt product is 96*l.* 6*s.* which is the value of 36; but we want to know the value of 39; wherefore I multiply the price of one, viz. 2*l.* 13*s.* 6*d.* by 3 that is defective or wanting to make up 36 to 39, ſaying, 3 times 6 is 18*d.* &c. and find that 3 times 2*l.* 13*s.* 6*d.* is 8*l.*

os. 6*d.* which added to 96*l.* 6*s.* o*d.* the total, gives the mplete value of 39; for 36 and 3 makes 39. See the rk.

Example 2. What comes 79 cwt. of cheese to, at *s.* per cwt.?

l.	*s.*	*d.*	
1	8	0	
			7 and 11
9	16	0	
			11
97	16	0	
2	16	0	
10	12	0	*Anſ.*

In this example, I ſay, 7 times 0 is 0; then 7 times 8 is 56; which is 2*l.* 16*s.* ſet down 16, and carry 2; then 7 times 1 is 7, and 2 carried make 9. So the firſt product is 9*l.* 16*s.* o*d.* which multiplied by 11 produces 107*l.* 16*s.* o*d.* or the value of 77; then for 2 wanting, I multiply the price by it, and at gives 2*l.* 16*s.* o*d.* which added to 107*l.* 16*s.* o*d.* makes e whole value of 79, viz. 110*l.* 12*s.* o*d.* as in the work.

r, as there are no pence in the price, you may multiply *s.* by 79, without bringing it into pounds, you work it, but omit it till the laſt, and en cut off or ſeparate the laſt figure or pher of the product towards the right nd, and halve thoſe towards the left, which lf will be pounds, and the figure cut off illings, as in this example:

s.
28
79
252
196
221 2

l. 110 12

The half of 2 is 1, and the half of 1 is 0, which 1 ined to the two ſevered from 221, makes 12: So the nſwer is 110*l.* 12*s.* as before.

Example 3. 112 pounds of ſugar, at 5½*d.* per lb. ſet own thus:

s.	*d.*	
	5½	per lb.
	10	and 10
4	7	
	10	
2	5	10
	5	6 the product of 5½*d.* by 12 defective.
2	11	4 *Anſ.*

Here,

Here, after I have multiplied by 10 and 10, the part of 100, there wants 12, wherefore I multiplied 5¼ by 12, and it gives 5*s.* 6*d.* for 12 lb. at 5¼*d.* which added to 2*l.* 5*s.* 10*d.* the value of 100, makes 2*l.* 11*s.* 4 the due value of 112 lb. at 5¼*d.* per pound.

Example 4. 94 ſtone of beef, at 22*d.* or 1*s.* 10*d.* p ſtone.

1*s.*	10*d.*	
	10 and 9	
18	4	
	9	
8	5	0
	7	4
8	12	4 *Anſ.*

Here what is wanti after the two multiplic tions, is 4; wherefore multiply 1*s.* 10*d.* (t price) by 4, which pr duces 7*s.* 4*d.* to be a ded, &c.

Example 5. 97 ½ cwt. of raiſins,

	l.	*s.*	*d.*	
at	1	5	6	per C.
			9 and 10	
	11	9	6	
			10	
	114	15	0	
	8	18	6	
	0	12	9	for the ½ C.
	124	6	3	

After I have multipli by 9 and 10, I multip the price 25*s.* 6*d.* by t quantity wanting, and produces 8*l.* 18*s.* 6*d.* th for the half C. I take ha of the price, which is 12 9*d.* and then collect t three lines, the total which is 124*l.* 6*s.* 3*d.* f the anſwer.

Note, From the laſt example may be obſerved, th there is no need of too much ſolicitude, concerni coming ſo very near by two multiplications, for there wanting to make up the true quantity; nay, if the tw multiplications be ſhort by 10 or 12, it is near enough for it is as eaſy to multiply the price by 10 or 12, as b 2 or 3, and the addition is the ſame.

Example 6. Once more; What comes 110 C. of ho to, at 4*l.* 10*s.* 6*d.* per C?

l.	*s.*	*d.*	
4	10	6	
		10	and 10
45	5	0	
		10	
52	10	0	
45	5	0	
2	5	3	
1	2	7½	
101	2	10½	*Anſ.*

After having multiplied by 10 and 10 which makes 100, I multiply the price 4*l.* 10*s.* 6*d.* by 10 that is wanting, which gives the ſame with the firſt product, viz. 45*l.* 5*s.* 0*d.* which ſtands under the product by 100; and for the ¼ of a C. I take ¼ of the price, viz. firſt the half, and then the half of that half, that is 2*l.* 5*s.* 3*d.* and 1*l.* 2*s.* 7½*d.*; which four lines added together, make 501*l.* 2*s.* 10½*d.* for the anſwer.

To prove Multiplication.

Whether of ſimple numbers, or of money, it is moſt rely done by diviſion; but before that is known, take is method, viz. As you multiplied the multiplicand by e multiplier, ſo contrariwiſe multiply the multiplier by e multiplicand; and if the products are alike, the work right; or otherwiſe one of them is wrong, and muſt gone over again till they do agree.

Example 1.

365 days in a year.
24 hours in a day.

1460
730

8760

Here (reverſely) I ſay, 5 times 4 is 20, 0 and carry 2; times 4 is 24, and 2 is 26, 6 and carry 2; and 3 times is 12, and 2 is 14. Then 5 times 2 is 10, 0 and carry 1; 6 times 2 is 12, and 1 is 13, 3 and carry 1; and times 2 is 6, and 1 is 7. Which products added together, make 8760, the hours in a year, without taking the odd 6 hours, which the year doth conſiſt of more than 365 days.

Example 2.

56 gallons of ſpirits			
	s.	*d.*	
at	3	2	per gal.
		7	and 8
1	2	2	
		8	
8	17	4	*Anſ.*

I ſay here, twice 7 is 14; 2 a carry 1*s.* and 3 times 7 is 21, a 1 is 22*s.* or 1*l.* 2*s.* Again, tw 8 is 16*d.* 4 and carry 1*s.* a twice 8 is 16, and 1 is 17*s.* and carry 0; and once 8 is Thus both theſe examples are t ſame in conſequence as if you p ceeded in the common and reg method of multiplication, a ſhews the truth of the operation. The next rule in o der is

DIVISION.

THIS rule, though accounted the hardeſt leſſon arithmetic, yet I ſhall make it eaſy and inte gible to the meaneſt capacity.

The uſe of this rule is to know how many times number or ſum is contained in another; as if it w aſked, how often is 9 contained in 55? The anſwer times; or how many times 12 is there in 144? Anſ 12 times.

As by multiplication great names or denominations brought into ſmall, ſo contrarily by diviſion, ſmall na are brought into greater; as farthings (from one gra tion to another) into pounds, pounds weight into t weight, and gallons liquid into tuns liquid, &c.

In this rule we are to take particular notice of th three certain terms following, viz.

1. 2. 3. } The { *Dividend*, or number to be divided. *Diviſor*, or number by which we divide. *Quotient*, or anſwer to the work; which ſh

how often the diviſor is contained in the dividend.

4. The remainder; which is an uncertain branch this rule, becauſe there is ſometimes a remainder, ſometimes not. And you muſt particularly note, T the remainder is ever of the ſame name with the d dend, and is always leſs than the diviſor; for if it be m or equal to the diviſor, the work is wrong.

Diviſion is either ſingle or compound; ſingle, w the diviſor conſiſteth of a ſingle figure, and the divid of two at moſt; any of this ſort is anſwered by the m tiplication table; as if 63 were to be divided by 7,

er will be 9 times. Here 63 is the dividend, 7 the
or, and 9 the quotient or answer.
ompound division is when the dividend hath many or
e figures or cyphers, than two, and the divisor one or
e figures or cyphers, &c.

Example.

ow many times 7 is there contained in 365? Or how
y weeks in a year?

7) 365 (52
35

neral rule for working.

1. Seek
2. Multiply
3. Subtract
4. Bring down

15
14

(1)

aving set down the example with two crooked lines,
lf parenthesis, one for the divisor and the other for
quotient, I begin according to the aforemention-
eneral rule for working, by seeking or asking how
n I can take 7, the divisor out of 36 the two first
es of the dividend, (for I cannot take 7 out of 3,
quotient being never to begin with o), and the an-
is 5 times; wherefore I place 5 in the quotient, and
iply the divisor 7 by it, (as directed in the general
), saying 5 times 7 is 35; which I place under 36,
then thirdly, according to the said rule, I subtract
from 36, and there remains 1; to which I bring
n the next or last figure of the dividend, viz. 5, and
there is 15 for a new dividend or dividual to work
n; then I ask or seek again how oft 7 may be taken
5. and the answer is 2 times; wherefore I put 2 in the
ient next to the 5; by which 2 I also multiply the
or 7, saying, twice 7 is 14; which I set down under
and subtract, and there remains 1, which I place be-
n two semicircles thus (1), as it stands in the work;
e observe, that 365 is the dividend, 7 the divisor, 52
quotient or answer, and 1 the remainder; the quo-
declares, that 7 is contained in 365 52 times, and 1
, or remaining; which I set over the divisor thus $\frac{1}{7}$,
signifies, that there is one seventh of a week, or 1
more than just 52 weeks in a year, or 365 days;
h is easily to be found by collecting the days of each
ndar month as they stand in the almanack.

You may note, That the ſaid $\frac{4}{8}$ is properly what is called a fraction, or a piece or ſegment of the dividend; but of this hereafter.

Note alſo, That if there had been more figures or cyphers in the dividend, they muſt have all been brought down one by one at a time, (and never but one at a time) and (after ſubtraction) ſet to the remainder: and if there remains 0, you muſt ſtill bring down but one figure or cypher at a time: and for every figure or cypher ſo brought down, there muſt be a figure or 0 placed in the quotient, according to the times you can take the diviſor out of the ſeveral dividuals you make, by bringing down a figure or cypher at a time out of the dividend, till all be brought down, and the work ended.

For a ſpecimen, let us divide 8060 pounds of tobacco equally among 8 men.

8)8060(1007 quotient.
8...

060
56
---
(4)

Here I ſay the eighths in 8 once, which I put in the quotient; then the eighths in 0, 0 times; which I likewiſe put in the quotient; then the eighths in 0, 0 times again; which is alſo placed in the quotient, and there remains 6; to which I bring down 0, the laſt of the dividend, and it makes 60; laſtly, the 8's in 60, 7 times, and 7 times 8 is 56, from 60, and there remains 4; ſo the quotient ſhews that each perſon muſt have 1007 pounds of tobacco for his ſhare in the dividend 8060, and there remains 4 pounds over and above, which makes half a pound more due to each man, becauſe 4 the remainder is half of 8 the diviſor; and ſo the work is done, the quotient giving to each man 1007 pounds and an half, for his equal ſhare.

Note, That in the operation, every time that you bring down a figure or cypher, you are to make a point under it in the dividend, to ſignify that ſuch a figure or cypher hath been brought down and done with, as may be obſerved in the foregoing example.

Though this way of working is plain, and eaſy to be underſtood, yet it is ſomewhat tedious; and therefore I ſhall ſhew a quicker way for diſpatch, when the diviſor

a ſingle figure; as ſhall be made conſpicuous in theſe examples following, viz.

	I.	II.	III.
	4)78906	5)34567	6)29702
Quotient	19726 (2)	6913 (2)	4950 (2)
	4	5	6
Proof	78906	34567	29702

In the firſt of theſe examples I ſay, the 4's in 7 once, and there remains 3; which conſidered as placed before the next figure in the dividend makes 38; then the 4's in 38, 9 times; 9 times 4 is 36, from 38, and there remains 2; which makes 9, the next figure in the dividend 29; then the 4's in 29, 7 times; 7 times 4 is 28, from 29, and there reſts 1; which makes 0, the next of the dividend, 10, and the 4's in 10 twice; twice 4 is 8, from 10, and there remains 2; which makes 6 the laſt figure in the dividend, 26; laſtly, the 4's in 26, 6 times, and 6 times 4 is 24, from 26, and there reſts 2, the remainder. And ſo for the other two examples. And for proof of the work, (or of any other example) multiply the quotient by the diviſor, and take the remainder in the firſt place, or place of units; and if the product be the ſame with the dividend, the diviſion is right: for I ſay, 4 times 6 is 24, and 2 the remainder, makes 26, 6 and carry 2, &c.

More Examples by a ſingle Figure.

	3)54321	7)279060	9)234567
Quotient	18107 (0)	39865 (5)	26063 (0)
Proof	54321	279060	234567

This is the ſhorteſt way of diviſion that can be, by a ſingle figure.

As it is neceſſary for expedition to divide by 11 and 12 as by a ſingle figure, to have the product in one line; ſo divide as in theſe examples, viz.

	11)72646206	12)76677240
Quotient	6604200 (6)	6389770
	11	12
Proof	72646206	76677240
	11)47627000	12)42007400
Quotient	4329727 (3)	3500616 (8)
	11	12
Proof	47627000	42007400

In the first of these examples, I say the 11's in 72 answer 6 times, &c. In the second, I say, the 12's in 76, answer 6 times, &c. In the third, the 11's in 47, 4 times; 4 times 11 is 44, from 47, and there rests 3, &c. In the fourth, I say, the 12's in 42, 3 times; 3 times 12 is 36, from 42, and there remains 6, &c.

By being ready and dextrous in the examples above, you may expeditiously divide by these numbers, viz. 110, 120, 1100, or 1200, &c. for it is but cutting off, or separating the cyphers from 11 and 12, (when these numbers happen to be divisors) and cutting off and separating the like number of figures or cyphers, from the right hand of the dividend, and then divide the figures or cyphers towards the left hand by 11 or 12, as it shall happen, as in the example following, viz.

Divide 34567 by 110, and 890123 by 120, and 98765 by 1100, and 678901 by 1200.

	110)3456,7	120)890123
Quotient	$314\frac{2}{11}$ or $\frac{27}{110}$	$7417\frac{83}{120}$ or $\frac{11}{11}$
	1100)987,65	1200)6789101
	$89\frac{8}{11}$ or $\frac{856}{1100}$	$565\frac{9}{12}$ or $\frac{901}{1200}$

When you divide by 10, 100, 1000, or 10,000; you have nothing more to do than to cut off, or to separate so many figures or cyphers of the dividend towards the right hand, as you have cyphers in the divisor, and those figures towards the left make your quotient; and those cut off towards the right the remainder.

Examples.

Divide 123456789 by 10, 100, 1000, 10,000.

By 10 the quotient is 12345678, and the remainder 9

B

By 100 the quotient is 1234567, and remainder 89.
By 1000 the quotient is 123456, and remainder 789.
By 10,000 the quotient is 12345, and remainder 6789.

When the diviſor conſiſteth of ſeveral figures, then there ariſeth a little more difficulty in the work; but if the following directions are heedfully attended to, the ſeeming difficulty is eaſily overcome; as in the ſucceeding example, viz.

Suppoſe I am to divide 78901 pounds among 32 pariſhes; or ſuppoſe an aſſeſſment of ſo much money was laid on ſo many pariſhes; what muſt each pariſh pay by an equal proportion towards the raiſing ſuch a ſupply?

Diviſor 32) 78901 (··· Quotient.

The example thus ſet out, I begin at the left hand, ſeeking how often I can take 32 out of 78: or more eaſy, how many times 3 there is in 7, and the anſwer is 2 times; which I place in the quotient thus, 32)78901(2, and then, according to the general rule of working, I multiply the diviſor 32, by the 2 placed in the quotient, ſaying, twice 2 is 4, and twice 3 is 6, ſo there is 64 to be taken out of 78, which ſhould ſtand thus;

32)78901(2
64

14

Then I make a point under 9, the 3d figure of the dividend, and bring it down to the remainder 14, and then the work appears thus:

32)78901(2
64

149

Seeking again, I aſk how many times 32 in 149; which is not readily to be anſwered; but how many times 3, the firſt figure of the diviſor, is there in 14, the two firſt figures of the dividual 149, and the anſwer is 4 times; wherefore, after placing 4 in the quotient, I multiply (as directed in the general rule) the diviſor 32, by the ſaid 4, ſaying, 4 times 2 is 8, placing it under 9 in the dividual; then 4 times 3 is 12, which ſet down under 14; ſo there is 128 to be taken out of 149, and then the work appears thus:

```
32)78901(24
  64
  --
  149
  128
  ---
  210
```

And after ſubtraction there remains 21; then I make a point under 0 in the dividend, and bring it down to the right of the remainder 21, and then there is 210, for a new dividual; then, as the general rule directs, I ſeek again, ſaying, How many times 32, the diviſor, is there in 210, the dividual? Or eaſier, how many times 3 in 21? But obſerve well, That whenever you have a place more in the dividual than in the diviſor, then always ſeek how oft you can take the firſt figure of the diviſor out of the firſt two of the dividual, and the anſwer is 7 times; but it will not bear 7 times, for 7 times 32 is 224, and you cannot take 224 out of 210 or you cannot take 22 out of 21; wherefore try in your mind, before you ſet down the anſwer, or figure of the quotient, whether it will go to the number of times, as is moſt eaſily ſuggeſted; as here the queſtion or demand is readily anſwered 7 times; and ſo many times 3 may be taken in 21; but when you come to multiply the whole diviſor by the times you place in the quotient, you begin at the right hand, and go towards the left, carrying the tens that ariſe to the next place, which increaſes the product ſo, that ſometimes ſubtraction cannot be made, becauſe the under line is greater than the upper; wherefore firſt try in your mind as above-ſaid; and ſince it will not bear 7 times, try if it will go 6 times; ſaying, 6 times 2 is 12, 2 and carry 1, and 6 times 3 is 18, and 1 is 19: And 19 may be taken out of 21; therefore ſet down 6 in the quotient next to the 4, and multiply the diviſor 32 by it, and the work will ſtand thus:

```
32)78901(246
  64
  --
  149
  128
  ---
  210
  102
  ---
  181
```

Here the diviſor 32 multiplied by 6, gives 192 to be taken out of 210, and the remainder is 18; to which, after a point made under it, I bring down the 1, the laſt figure of the dividend, and then there is 181 for a new dividual, then, according to the rule, I ſeek again, (for you are to note, That the aforeſaid general rule of working muſt be as often repeated, as you bring down a figure or cypher from the dividend, to make a new dividual; and alſo, that for every figure or cypher brought down, there muſt likewiſe be a ſingle figure or cypher

cypher placed in the quotient) how many times 32 the diviſor may be taken out of 181 the dividual; or how many times 3 in 18, and the ready anſwer is 6 times; but on the trial I find it will not go 6 times; wherefore I try a quotient figure leſs by one, viz. 5 times, and find it will bear it; and ſetting 5 in the quotient next to the 6, I multiply the diviſor 32 by it, and it produces 160; which ſubtracted from 181, the laſt remainder is 21, and the quotient or anſwer is 2465; which ſhews that 32 is contained in 78901, 2465 times, and 21 over.

```
32)78901(2465
 64...
 ----
 149
 128
 ----
  210
  192
  ----
  181
  160
  ----
  (21)
```

Again, admit a nobleman hath 30,000*l.* per annum, what is his daily income?

If you divide 30,000 by 365, (the days in a year) the quotient will be the anſwer. Set it down for working thus:

365)30,000(

Firſt ſeek how many times 365 can be taken in 300; (an equal number of places with the diviſor) anſwer 0 times; wherefore I go a place farther to the right hand, in the dividend, (for nought muſt never begin the quotient, as we ſaid before) and make a point under it, viz. under the laſt 0 but one, as may be ſeen in the example; and there being a place more in this dividual than in the diviſor, I ſeek how oft the firſt figure of the diviſor, viz. 3, is contained in the two firſt figures or places of the dividend, viz. 30, and the anſwer is 10 times; but you are never to take above 9 times at once in any of theſe examples of diviſion; wherefore try in your mind whether it will bear 9 times before you ſet it down in the quotient, (as was ſaid before) ſaying to yourſelf, or in your mind, 9 times 5 is 45; 5 and go 4; 9 times 6 is 54, and 4 is 58; 8 and go 5; and 9 times 3 is 27, and 5 is 32; now 32 cannot be taken out of 30, wherefore take a figure leſs by an unit or one, viz. 8 times, and finding it will go 8 times, ſet down 8 in the quotient; and then ſay 8 times 5 is 40; 0 and carry 4; and 8 times 6 is 48, and 4 is 52; 2 and carry 5; and 8 times 3 is 24, and 5 is 29; and then there

is 2920 to be taken from 3000; and after ſubtraction the work will appear thus:

365)30,000(8
2920

80

Then to the remainder 80, I bring down 0, the laſt figure of the dividend, and then there is 800 for a new dividual: Then you muſt try how oft you can take 365 out of the ſaid dividual 800, and the number of places being equal in both diviſor and dividual, to wit, 3; aſk how oft 3 in 8; anſwer twice; ſo put 2 in the quotient, and ſay, twice 5 is 10; 0 and carry 1; and twice 6 is 12, and 1 is 13; 3 and carry 1; and twice 3 is 6, and 1 is 7; ſo there is 730, to be deducted from 800, and the remainder is 70, as in the work may be ſeen, viz.

365)30,000(82
2920
800
730
(70)

Thus it appears that the nobleman hath eighty-two pounds *per diem*, and 70 pounds over, which if multiplied by 20, the ſhillings in a pound, would produce 1400 ſhillings; which if divided by the diviſor 365, there would come out 3*s*. a day more, and there will be a remainder of 305, which multiplied by 12, the pence in a ſhilling, produces 3660; which divided ſtill by 365, gives 10 pence a-day more: So that 30,000*l*. a-year, is 82*l*. 3*s*. 10*d*. a-day.

Once more, divide 46242 gallons by 252, the gallons in a tun, thus ſet down:

252)46242(183
252
2104
2016
882
756
(126)

In this example, after enquiry, I find that it will not go twice, therefore I ſet down 1 in the quotient, and place 252 under 462 in the dividend, and, after ſubtraction, the remainder is 210; to I which bring down 4 from the dividend, and the dividual is 2104; and then ſeeking again, find it will bear 8 times; which placed in the quotient, and the diviſor 252 multiplied by it, the product is 2016 to be ſubtracted from 2104; which being done, the remainder is 88; to which 2, the laſt figure of the dividend, being brought down, there is 882 for the laſt dividual: And then ſeeking again, I find it will go 3 times; and the product

product of the diviſor multiplied by 3, is 756; which ſubtracted from 882, there remains 126 for the remainder; ſo that by this diviſion I find there are 183 tuns in 46242 gallons, and 126 gallons remaining, or over and above; which being half of 252 the diviſor, the remainder is therefore half a tun more.

When you have a cypher, or cyphers, in the diviſor, in the firſt, ſecond, or third place, &c. ſeparate ſuch cypher or cyphers, with a daſh of the pen, from the reſt of the diviſor, and alſo cut off as many figures or cyphers from the right of the dividend, as you cut off cyphers from the diviſor, and divide the remaining figures towards the left hand by the remaining ſignificant figures of the diviſor.

Example.

Divide 42952 ſquare poles of land by 160, the ſquare poles in an acre of land.

```
160)42952(268
   32...
   ---
   109
    96
   ---
   135
   128
   ---
   (7)
```

Here the cypher is cut off from the diviſor, and 2 from the dividend: Then I aſk how oft 16 in 42? Anſwer twice; then the 16's in 109, anſwer 6 times, then the 16's in 135, anſwer 8 times. So there are 268 acres, and 7 remains, that is 268 acres, and $\frac{7}{160}$ or $\frac{72}{1600}$ or almoſt half an acre.

Divide 27100)02746120(2323 $\frac{25}{271}$ or $\frac{25}{27100}$

```
   54...
   ---
   87
   81
   ---
   64
   54
   ---
   106
    81
   ---
   (25)
```

In this example two cyphers are ſeparated from the diviſor, and alſo two places from the dividend, and then 62746 is divided only by 27. See the work.

When the diviſor is 3, 4, 5, 6, or more figures, there is a ſure and eaſy way of performing the work truly, by making a table of the diviſor; which may be done by addition, or by multiplying the diviſor by 2, 3, 4, &c. Admit you are to divide 98765432 1 by 123456.

123456)

123456)987654321(8000 times
987648 . . .

(6321

Here having noted the number of figures in the diviſor, which here is 6, I make a point under the ſixth figure or place of the dividend, whereby 987654 becomes the firſt dividual.

1	123456
2	246912
3	370368
4	493824
5	617280
6	740736
7	864192
8	987648
9	1111104

The foregoing table is made by doubling the firſt line, which makes 246912: This added to the firſt or uppermoſt line, gives the 3d line 370368: which alſo added to the ſaid firſt line, makes 493824 for the 4th line or product; and ſo of the reſt; ſtill remembering to add the ſubſequent line or product to the firſt or uppermoſt line, till you come to the laſt line of 9 times, which is 1111104; the truth of which may be proved by multiplying the firſt or uppermoſt line by 2, 3, 4, 5, &c. and if you commit an error by addition, it may be found or corrected by multiplication.

The uſe of the ſaid Table.

When you have pointed out your number of places in the dividend, caſt your eye on the table, and at the firſt view you may know how many times you can take, as in this example, 7 times is too little, and 9 times too much; wherefore I ſet down 8 in the quotient, and place 987648, the tabular number which ſtands against 8 under the dividual, then I ſubtract that number from the dividual, and the remainder is 6; to which I bring down 3, and put 0 in the quotient, then to the 63, bring down 2, and place 0 in the quotient; to the 632 I bring down 1, the laſt figure of the dividend; but ſtill it will not bear any times or time, wherefore I put an other 0 in the quotient, and ſo the work is done, and

the quotient is 8000, and remainder 6321; as in the work.

Thus having plainly, fully, and pertinently ſhewn, by verbal directions, the method of working diviſion; I think it unneceſſary to give any more examples in that manner, but ſhall leave ſome few examples for practice ſake, whoſe quotients and remainders are expreſſed, but the operation omitted, to ſave room, and for trial of the ingenuity of practitioners.

7400690042 divided by 987, the quotient is 7498166 and remainder 200.

479679002742 divided by 4689, the quot. is 102298784, and the remainder 4566.

7969767002 divided by 976294, the quotient is 8163, and remainder is 279080.

456789012345 divided by 9876543, the quotient is 46259, and remainder 8775138.

764697 by 4500, quotes 169, and remainder 9127.

And 8092320000 by 345000, quotes 23456, and remains 0.

The Proof of Multiplication and Diviſion.

THESE two rules reciprocally prove each other; for in proving multiplication, if you divide the product by the multiplier, the quotient will be the multiplicand; or if by the multiplicand, the quotient will be the ſame with the multiplier.

Example 1.

345
24

1380
690
---
24)8280(345
72

108
96

120
120
---
(0)

Example 2. Or thus:

345)8280(24
690

1380
1380
---
(0)

To prove Diviſion.

Diviſion may be proved by diviſion, thus:

If you divide the dividend by the quotient, the quotient will be your former diviſor.

Example.

Divide 8280 by 345.

345)8280(24

Here the working again is needleſs, it being in the page foregoing; ſhews the truth of the aſſertion, that diviſion may be proved by diviſion as aforeſaid.

But the moſt uſual way of proving diviſion is by multiplication, in this manner, viz. multiply the quotient by the diviſor, and the product will beequal to the dividend: See the example in the foregoing page.

345 Quotient
24 Diviſor

1380
690

8280 Proof

Note, That when there is any remainder, ſuch remainder muſt be taken in, or added to the product.

As in multiplication I gave ſome examples of its utility in money, ſo likewiſe I ſhall give a few examples in diviſion of money, whereby may be ſeen how expeditiouſly ſome things may be done, without having recourſe to reduction, the rule of three, &c. viz.

Example 1.

Divide 26*l.* 12*s.* 6*d.* equally among five men. For diſpoſition of working, ſet it down as follows:

	l.	*s.*	*d.*
5)	26	12	6
	5	6	6
Proof	26	12	6

In the working of this, I ſay, th 5's in 26, 5 times; 5 times 5 is 2 from 26, and there remains 1, th is 1 pound, or 20 ſhillings; whic with the 12*s.* in the place of ſhilling makes 32*s.* then the 5's in 32, times; 6 times 5 is 30*s.* from 3 and there remains 2*s.* or 24*d.* whic with 6*d.* in the place of pence, makes 30; then the 5 in 30, 6 times; and ſo the work is done, and the anſw is, that each man muſt have 5*l.* 6*s.* 6*d.* for his equ ſhare in the ſaid diviſion of 26*l.* 12*s.* 6*d.* amongſt fi perſons

erſons: and the truth of it is proved by multiplication f money, ſufficiently ſhewn in the rule of Multiplica- ion; as here, 5 times 6 is 30, 6 and carry 2; and 5 imes 6 is 30, and 2 is 32, 12 and carry 1; and 5 times is 25, and 1 is 26, &c.

Example 2.

Divide the charges of a country-feaſt, amounting to 246*l.* 13*s.* 4*d.* equally amongſt 12 ſtewards, to know what each ſteward muſt pay.

l.	*s.*	*d.*	
12) 246	13	4	
Anſ. 20	11	$1\frac{4}{12}$	

Here I ſay the 12's in 24 twice, and 12's in 6, 0 times, and there remains 6*l.* or 120*s.* and 13*s.* makes 133; and then the 12's in 133, is 11, and there remains 1*s.* or 12*d.* 5 hen 12 and 4 is 16, and the 12's in 16 once, and 4 re- ains; ſo that each ſteward muſt pay 20*l.* 11*s.* $1\frac{4}{12}d.$ r four twelfths of a penny, ſomething more than a farthing; and this may be proved as that above.

When any quantity is ſuch a number, that any two igits of the multiplication table multiplied together ake the ſaid quantity or number, then the quotient ay be very expediouſly found at two diviſions, and ooner than at one. *Example.* Divide 7872 by 32. n this example, the component parts, which multiplied ogether make the diviſor 32, are 4 and 8, or 8 and 4; or it matters not which of them you divide by firſt; or either way will give a true and the ſame quotient; s may be ſeen by the different methods of the following work:

4) 7872		Or thus, 8) 7872	
8) 1968		4) 984	
246 Quotient.		246 Quotient.	

Here, though the operations are divers, yet the quo- ients are one and the ſame. Again, divide 44184 by 56.

Example.

7) 44184	
8) 6312	
789 Quotient.	

Here

Here the diviſors are 7 and 8, or 8 and 7; for either or both will give the ſame quotient.

And thus may above forty examples be wrought by numbers out of the multiplication table, with great diſpatch and expedition, as by 15, 18, 25, 35, 64, 72, 96, &c.

When it happens that there is any remainder, in the firſt diviſion, or the laſt, or both; to know the true remainder, as if you divided by the common way, take this method, viz. multiply the firſt diviſor by the laſt remainder, and take in or add the firſt remainder, if there be any, and the product will be the true or ſame remainder, as if you divided by the long way.

Example. Divide 4567 by 15.

3) 4567
5) 1522 1
3 0 4 2

Here I multiply 3, the firſt diviſor, by 2, the laſt remainder, and take in 1, the firſt remainder, and it makes 7 for the true remainder, as may be proved at leiſure by the other way.

(7)

The ſame method may be taken with reſpect to component parts in diviſion of money, as in diviſion of ſimple numbers.

Example.

3) *l.* *s.* *d.*
Divide 463 18 6 into 18 equal parts.

6) 154 12 10

Anſ. 25 15 $5\frac{4}{8}$

By this method of diviſion of money, (if the quantity be as aforeſaid, made by even component parts) you may, by having the price of ſeveral things, know the price or value of one thing at the ſaid rate, as well as by the rule of three: So doth multiplication of money anſwer queſtions in the rule of three, when the firſt number is an unit or one.

Example by Diviſion,

7) *l.* *s.* *d.*
If 48 *lb.* of coffee coſt 31 10 0 what coſts 1 *lb.*

12) 4 10 0

Anſ. 0 7 6 a pound.

As

As in the multiplication of money, to have an anſwer, you multiply the price by the quantity; ſo in diviſion of money, you divide the price by the quantity, to have your anſwer.

I could ſpeak more largely, if I had room, of the excellent uſes that may be made of multiplication and diviſion only; but their various uſes will be better underſtood by their application in the following rules of arithmetic, particularly in the next rule, called

REDUCTION,

WHICH is an application of multiplication and diviſion, ſhewing how to reduce numbers of one denomination to another, thereby diſcovering the ſame value, though in different terms.

1. As firſt, all great names are brought into ſmaller by multiplication, as pounds into ſhillings, pence, or farthings, by multiplying by 20, 12, and 4. Or hundreds weight into pounds weight, by multiplying by 4 and by 28, or by 112; or lower into ounces or drams, by multiplying by 16 and 16.

2. And on the contrary, all ſmall names are brought into greater by diviſion; as farthings into pounds, by dividing by 4, 12, and 20; and pounds weight into hundreds weight, by dividing by 28 and 4; the drams into pounds, by dividing by 16 and 16.

But you may note, That pounds are brought into pence, by multiplying by 240; or into farthings, by multiplying by 960; and juſt the contrary by diviſion.

The ſenſe, meaning, and uſe of reduction is expreſſed in the following verſes:

Reduction *ſhews how we of names in uſe*
May great to ſmall, and ſmall to great, reduce;
So that the anſwer which ſhall thence ariſe
The given ſum in value equalize:
Multiply, or divide it back, you muſt,
Which makes again your given number juſt.

Example 1.

In 240 Pounds ſterl. how many pence?

20 Shillings 1 pound.

4800 Shillings in 240*l.*
12 Pence 1 ſhilling.

Anſ. 57600 Pence in 240*l.*

Or thus:

240*l.*
240*d.* in 1*l.*

9600
480

Anſ. 57600

Example 2.

In 226 tons of copper, how many pounds weight?

20 C. 1 ton.

4520 Hund. wt. in 226 tons
4 qrs. 1 C.

18080 qrs. of a c. wt. in 226 tons.
28 lb. 1 qr. of a C.

144640
36160

506240 Pounds wt. in 226 tons.

Or thus:

226 Tons.
20

4520
112

54240
4520

506240 Pounds.

Theſe foregoing examples are great names to be brought into ſmall, (as may eaſily be obſerved and underſtood); therefore, as the firſt rule directeth, it is done by multiplication, by multiplying the greater name by the number of the next leſſer name, that makes one of the ſaid greater; as in the laſt examples the leſſer name to pounds is ſhillings; wherefore I multiply by 20, becauſe 20 of that leſſer name make one of the ſaid greater name, *i. e.* 20 ſhillings make a pound. And the ſame regard is had, and method obſerved, in the example of weight; as is very plain to be ſeen in the work, and is called reduction deſcending, becauſe it brings higher or greater denominations into lower or leſſer.

Example

Example 3.

Bring 494400 Farthings into Pounds.

4) 494400 Farthings.

12) 123600 Pence.

20) 10300 Shillings.

515 Pounds.

Or thus:

960) 494400 (515*l.*
480
144
96
480
480
(0)

In this way I divide by 960, the farthings in a pound, &c.

In the firſt way I divide the farthings by 4, becauſe 4 of them make a penny, and the quotient is pence; then theſe pence I divide by 12, becauſe 12 of them make a ſhilling, and that quotient is ſhillings; which ſhillings I divide by 20, to bring them into pounds, thus: I cut off the cypher in the dividend towards the right, for the cypher that is in the diviſor 20, which is alſo ſeparated from 2 with a daſh of the pen, (as may be ſeen in the work); then I halve the figures one by one, as they are united with the remainder in the dividend; which half is pounds, and is a ſhort way of dividing by 20; In the example, I ſay, the half of 10, (becauſe I muſt not ſet down 0 at the beginning) is 5, and the half of 3 is 1, and there remains 1; which makes the next, which is 0, 10; and the half of 10 is 5; ſo that 10300 ſhillings make 515 pounds, or there are ſo many pounds in 294400 farthings.

Note, In dividing by 20 as above, if any thing remains, it muſt be joined or annexed to the figure or cypher cut off; as ſuppoſe there had in halving the laſt figure (excepting what you cut off) remained 1: Then that one muſt have been joined to the cypher ſeparated or cut off, and there would have been ten ſhillings.

Example

Example 4.

Reduce 27552 pounds weight into hundreds weight.

4)

28) 27552 (984

252··

——

246 cwt. *Anſ.*

235

224

——

112

112

——

(c)

Or thus:

l.

112) 27552 (246 *Anſ.*

224··

——

515

448

——

672

672

——

(o)

In the firſt of the two foregoing examples, I divide the pounds by 28, to bring them into quarters; then I divide thoſe quarters by 4, to bring them into hundreds weight, as in the work.

In the ſecond way, I divide the pounds weight by 112, the pounds in a hundred weight, and it brings the pounds weight into hundreds weight at once.

The ſaid examples are of ſmall denominations to be brought into greater, and therefore, according to the ſecond rule of direction, it is done by diviſion, by dividing the leſſer name by as many of them as make the next greater name; that is by 28, becauſe 28 of them make one of the next greater name, viz. a quarter of an hundred; and this reduction is called Reduction Aſcending, becauſe it brings low or ſmall names to higher or greater denominations. —— By which it may be obſerved that all queſtions in reduction, whether aſcending or deſcending, are anſwered either by multiplication or diviſion, or by both; as will plainly appear in the ſundry examples of reducing of divers denominations to others.

When it is required to reduce numbers of ſeveral denominations by reduction aſcending, or by multiplication, you are to work as before; but you muſt always remember to take in ſuch numbers as ſtand in the place of the next inferior denomination, as when you multiply the pounds by 20, if there be any ſhillings in the denomination or place of ſhillings, you muſt take them in; ſo likewiſe, when you multiply the ſhillings by 12, if there be any pence in the place of pence, you muſt alſo take

them

them in: and ſo when you multiply the pence by 4, to bring them into farthings, you muſt take in the farthings, if there be any, in the place of farthings, as in the following work:

Example 5.

l. *s.* *d.*
In 346 16 9 halfpenny how many farthings?
20 Shillings 1 pound.

6936 Shillings in 346*l.* 16*s.*
12 Pence 1 ſhilling.

83241 Pence in 346*l.* 16*s.* 9*d.*
4 Farthings 1 penny.

332966 Farthings in 346*l.* 16*s.* 9*d.* halfpenny.

The example is ſo plain in the work, that it hardly needs any explication; but I begin to ſay 0 is 0, but 6 in the units of ſhillings is 6; then twice 6 is 12, and 1 in the tens of ſhillings is 13, 3 and carry 1; and twice 4 is 8, and 1 is 9; and twice 3 is 6; then by 12, ſaying 12 times 6 is 72, and 9*d.* (in the place of pence) is 81, 1 and carry 8; and 12 times 3 is 36, and 8 is 44, 4 and carry 4; and 12 times 9 is 108, and 4 is 112, 2 and carry 11; and 12 times 6 is 72; and 11 is 83, &c.

Example 6.

C. *qrs.* *lb.*
56 2 16 of Tobacco how many pounds wt.?
4 qrs. 1 cwt.

226 qrs. in 56 cwt. 2 qrs.
28 lb. 1 qr. of a cwt.

1814
453

Anſ. 6344 Pounds wt. in 56 cwt. 2 qrs. 16 lb.

In the foregoing work, I firſt multiply the 56 C. by 4, and take in 2 qrs. and then I multiply the 226 qrs. by 28, ſaying, 8 times 6 is 48, and 6 (the unit-figure in the odd pounds) is 54; 4 and carry 5, &c. Then I multiply by 2, ſaying twice 6 is 12, and 1 (that ſtands in the place of tens in the odd pounds) is 13, 3 and carry 1. Then adding

adding the two products together, they make 6344 pounds contained in 56 C. 2 qrs. 16 lb. as in the work is conſpicuous. Or, the example may be ſooner done, by multiplying the 56 C. by 112, the pounds in a cwt. and taking in the odd weight, viz. 2 qrs. 16lb. or 72 pounds at once.

C.	
56	I ſay here, 12 times 6 is 72; 2 and
112	carry 7; and 12 times 5 is 60, and 7
672	is 67; and then once 6 is 6, ſetting it
56,72 *odd wt.*	down in the third place, becauſe by
6344	multiplying by 12 at once two places are taken up: See the work.

Or, ſtill briefer thus, by ſetting down the 56 C. four ſeveral times, as on the margin, taking in the odd weight, as before; which makes the ſame as above, viz. 6344 pounds.

56 C.
56
56
56,72
6344

Reduction Aſcending,

Is the bringing numbers from a leſſer denomination to a greater, and is the reverſe of reduction deſcending; and each may ſerve as a proof to the other, one being performed by multiplication, and the other by diviſion.

And note, That when at any time in reduction deſcending you take in, or add to, the odd money, weight, or meaſure, as you multiply the ſeveral denominations, ſuch quantities will be the remainders in reduction aſcending.

4) *Examples by the two foregoing Sums.*

In 332966 Farthings how many pounds?

12) 83241 $\frac{1}{4}$*d.* remains what taken in.

20) 69316 9*d.* remains what taken in.

346 16*s.* remains what taken in.

So that in 332966 farthings there are 346*l.* 16*s.* 9$\frac{1}{4}$*d.* and is a ſure proof of the foregoing work deſcending.

Again,

Again, in 6344 pounds weight, how many hundred wt?

4
28) 6344 (226 qrs.
56··
74 56 C. 2 qrs. taken in.
56
184
168
(16) remains pounds taken in.

So that in 6344 pounds weight there is 56 C. 2 qrs. 16 lb. and proves the foregoing examples descending to be right.

Now follow promiscuous examples of both kinds of reduction, one proving the other.

In 276*l.* 12*s.* how many pence?

20
5532
12
Anſ. 66384*d.*

In 66384*d.* how many pounds?

12
210)5531[2
Anſ. l. 276 12 and *proof.*

In 47964 grains how many pounds Troy?

20)
24) 47964 (1998
24··· 12)99(18 pwts.
239
216
236
216
204
192
Grains (12)

In 8 lb. 3 oz. 18 pwts. 12 gr. how many grains?

12
99
20
1998
24
7994
3997
Anſ. 47964 and *proof.*

In

In 34 C. 3 qrs. of cotton-wool, how many pounds?

34	112) 3892	(34 C. ¼ *proof.*
34	336	
3484		
	532	
3892 lbs.	448	
		(84) lb. or ¾ of a C.

In 456 C. 3 qrs. 27 lb. of copper, how many pounds? And what comes it to at 21*d.* per lb.

456 C.	
456	Or thus:
456	456
456	112
111	
	5472
51183 pounds.	456
21*d.* per lb.	111
51183	51183 pounds.
102366	
1074843 pence; which bring into pounds by division, or reduction ascending, as before shewn, and it will amount to 4478*l.* 10*s.* 3*d.*	

Bring 4796 ells Flemish into ells English. Multiply 3 by 3, and divide by 5; because 3 quarters make an ell Flemish, and 5 an ell English.

5) 14288

2877⅗

Reduce 456 ells English into yards. Multiply by 5, and divide by 4, thus:

456 English ells.
5 qrs. 1 English ell.

4) 2280 qrs.

Yds. 570 *Ans.*

In 570 yards, how many Engl. ells?
4 qrs. 1 yard.

5)2280

Engl. ells, 456. *Ans.* and *proof.*

Bring

Bring 130 tuns of wine into gallons.

4 hogſheads 1 tun.

520

63 gall. 1 hogſh.

1560
3120

Anſ. 32760

Or thus:

252 gallons 1 tun.
130 tuns.

7560
252

32760 gallons.

Laſts. Qrs. Buſh. Pecks

Reduce 42 3 5 2 into pecks.

10 qrs. 1 laſt

423

8 buſhels 1 qr.

3389

4 pecks 1 buſhel

Here I multiply by 10, and take in 3 qrs. and then by 8, and take in 5 buſhels, and laſtly by 4, and take in 2 pecks.

13558 pecks in 42 laſts, 3 quarters, 5 buſhels, and 2 pecks.

In 13558 pecks, how many laſts, &c.

4) 13558

8) 3389-2 pecks taken in

110) 4213-5 buſhels taken in

Laſts 42-3 quarters taken in

Anſ. 42 laſts, 3 qrs. 5 buſhels, and 2 pecks.

By *Reduction* alſo

Foreign coins or exchanges may be reduced to ſterling money; and, on the contrary, ſterling money to foreign.

Examples.

Reduce 246 *Venetian Ducats de Banco* into ſterling money, the exchange at 52*d.* ſterling per ducat, thus;

246
52

492
1230

12) 12792

210 1066

£. 53 6 to be paid in London for the 246 ducats drawn in Venice.

Reduce 53*l.* 6*s.* ſterling into ducats, at 52*d.* ſterling per ducat.

20

1066
12

52) 12792 (246 ducats to be paid in Venice, for 53*l.* 6*s.* drawn in London.
104

23 &c.

To reduce Flemiſh money into ſterling money, divide the pence Flemiſh by the courſe of exchange, ſuppoſe 33*s.* 4*d.* and the quotient will be the ſterling money; and what remains multiply by 20, &c.

Example. In 242*l.* 13*s.* 4*d.* Flemiſh how many pounds ſterling, &c.

29

33*s.* 4*d.* Flemiſh 4853
12 12

400 4100) 58140(145

Remains 240
20

4100) 4800(12

Anſ. 145*l.* 12*s.*

By the work it appears, that 145*l.* 12*s.* ſterling answers, or is equivalent to 242*l.* 13*s.* 4*d.* Flemiſh, at 33*s.* 4*d.* per pound ſterling.

Thus

Thus Flemiſh money may be reduced to ſterling money, though the courſe of exchange be at any other rate of ſhillings and pence Flemiſh: But when at the rate above, viz. 33*s.* 4*d.* then the anſwer is ſooner found by multiplying by 3, and dividing by 5; for 400*d.* Flemiſh is equal to 240*d.* ſterling, (each being a pound), as 5 is to 3; for, if you divide 400 by 5, it quotes 80; ſo 240 divided by 3, quotes the ſame.

The foregoing example done by the laſt propoſed way.

l. 242 13 4 Flemiſh

3

5) 728 0 0

£. 145 12 0

Note. *French* money is reduced to Sterling, *viz. Livres, Sols, Deniers, (or French* pence) as Sterling or *Flemiſh* money, by multiplying by 20 and 12.

In 426 French crowns, each 54 $\frac{1}{4}$*d.* ſterling, how many pounds ſterling?

426
54
1704
2130
106 $\frac{2}{4}$ or $\frac{1}{2}$*d.*
12) 23110 $\frac{1}{2}$
2|0) 1925 10 $\frac{1}{2}$

In this example, the number of crowns is multiplied by 54*d.* and for the $\frac{1}{4}$*d.* I take the 4th part of 426, which is 106 $\frac{2}{4}$ of a penny, or halfpenny; which added to the other pence, gives for total 23110*d.* which divided by 12, quotes 1925, and 10*d.* remains; ſo the anſwer is 96*l.* 5*s.* 10 $\frac{1}{2}$*d.* ſterling, as in the work.

Anſ. *l.* 96—5 10 $\frac{1}{2}$*d.*

Again, bring 1600 pieces of eight, at 54 $\frac{1}{4}$*d.* ſterling, into pounds ſterling.

1600
54
6400
8000
400
12) 86800
2|0) 72313 4
£. 361 13 4

Here the 1600 pieces of eight are multiplied by 54, to bring them into pence; and for the $\frac{1}{4}$ I take the $\frac{1}{4}$ of 1600, &c. as in the work. And the anſwer is £. 361 13 4.

This method is of uſe in reducing the exchanges of Cadiz, Leghorn, and Genoa. Or when the exchange is at ſo many pence, and eights of a penny, (as often the exchanges run) then multiply the given number to reduce it into pence by the pence contained in a piece of eight; and alſo multiply the ſaid given number apart, by the numerator or upper figure of the fraction, and divide by the denominator, or under figure of the fraction, and the quotient will be pence; which add to the other pence produced by multiplying the given number by the pence contained in one of the pieces for exchange; then divide the total pence by 12, &c.

Example.

Bring 296 dollars, at $52\frac{5}{8}d.$ ſterling into pounds ſterling.

296
52
592
1480
15392
185
12)15577
210) 12918 1

296 Dollars
5
8) 1480
185

Anſ. l. 64 18 1. Sterling money due for 296 dollars at 52*d.* ſterling per dollar.

But ducats, dollars, crowns, millreas, &c. are more expeditiouſly caſt up by the rules of practice hereafter to be ſhewn.

And ſo much for Reduction. The next rule in arithmetic is

The GOLDEN RULE; or, Rule of Three.

IT is called the Golden Rule from its excellent performance in arithmetic, and in other parts of mathematical learning.

And it is called the Rule of Three, becauſe from three numbers given, propoſed, or known, we find out a fourth number required or unknown, which bears ſuch proportion

proportion to the third as the ſecond doth to the firſt number. From whence alſo it is called The Rule of Proportion.

And of this proportion there are two ſorts; one called Direct, and the other Indirect, or Reverſe.

Direct Proportion is, when the ſecond and third numbers are to be multiplied together, and their product divided by the firſt.

Indirect, or Reverſe Proportion is, when the firſt and ſecond numbers are to be multiplied together, and their product divided by the third.

In direct proportion, the fourth number, or anſwer to the queſtion, contains the third number as often (or as many times) as the ſecond contains the firſt.

But in indirect proportion the greater the third number is, the leſs is the fourth; and the leſſer the third number is, the greater is the fourth.

The ſtating the queſtion.

The chiefeſt difficulty that occurs in the Rule of Three is the right placing the numbers, or ſtating the queſtion: for when that is done, you have nothing more to do, but to multiply and divide, and the work is done.

And to this end we are to remember, that of the three given numbers two of them are always of one name or denomination, and the other number is ever of the ſame name with the fourth number or anſwer required; and muſt always be the ſecond or middle number; and the number that aſketh the queſtion muſt ſtill poſſeſs the third or laſt place; and the other number of the ſame name with the third, muſt be the firſt number; For the firſt and third numbers muſt always be of one name, viz. both money, both weight, both time; or both meaſure. And though they be of one kind, yet if one of them is altered by reduction, from a high to a lower name, then the other muſt be reduced to the ſame name. For you muſt particularly note, "That if either the firſt or third number conſiſts of ſeveral denominations, that is, of pounds and ſhillings; or pounds, ſhillings, and pence; or of pounds, ſhillings, pence, and farthings; or of tons hundreds, quarters, and pounds, &c. then muſt they be reduced to the loweſt name mentioned. And if one happen to be of divers denomina-

tions, and the other but of one name; then the number of one name muſt be reduced as low, or into the ſame name with the other; as ſuppoſe the firſt number is brought into farthings, then the third number, though but pounds, muſt be brought into farthings alſo. Then you are to multiply the ſecond and third numbers together, (when the proportion is direct) and divide the product by the firſt number: and the quotient thence ariſing will be the anſwer to the queſtion, and in the ſame name with the middle number; and if in a ſmall denomination, it muſt be brought by diviſion to the higheſt name, for the better underſtanding the anſwer." *You muſt alſo note*, "That if the middle number be ſeveral denominations, it muſt be brought into the loweſt mentioned."

Example 1.

If 12 gallons of brandy coſt 4*l.* 10*s.* what will 134 gallons coſt at that rate?

Gallons.	*l.*	*s.*	*Gallons.*
If 12	4.	10.	134
	20		90
	90		12) 12060
			210) 10015
			l. 50 5 *Anſ.*

Here the firſt and third numbers are of like names, viz. both gallons; and 134 being the number that aſked the queſtion, it hath the third place, as it always muſt, as before aſſerted; and 4*l.* 10*s.* the ſecond number, being of two denominations, viz. pounds and ſhillings, it is reduced into the loweſt mentioned, viz. ſhillings, as before directed, and then the three numbers are theſe viz. 12-90-134, and 134 the third number, being multiplied by 90, the ſecond number, produces 12060, which divided by 12, the firſt number, quotes 1005, which are ſhillings, becauſe 90, the middle number, were ſhillings, and 1005 ſhillings, divided by 20, gives 50*l.* 5*s.* for the anſwer: And for the proof of its truth, ſtate it back again thus:

Example

Example 2.

Gal. l. s. Gal.
If 134 coſt 50 5 what 12?
20

1005
12

134) 12060 (90s. *Anſ.* or 4l. 10s. the coſt of 12
1206 gallons, and is a ſure proof of the firſt work; and the back ſtating and working the proof is as much a queſtion in the rule of three as the firſt.

By the foregoing rules and directions, and theſe two operations, you may underſtand the nature of the rule, and method of working, and with eaſe and certainty anſwer any example propoſed in the rule of three direct; and therefore I ſhall omit what I can of verbal directions, and abate as much of figure work as is conſiſtent with diſpatch, and of not leaving the work too obſcure, to ſave room, and not to be too prolix; and to this end, I ſhall only give the examples ſtated, and a little of the work, and the anſwers to the queſtions, leaving moſt of the operations to be performed by ingenious practitioners.

Example 3.

If 56 lb. of indigo coſt 11l. 4s. what will 1008 lb. coſt at that rate?

lb. s. lb.
If 56 224 1008? *Anſ.* 4032s. or 201l. 12s.

Example 4.

If half a cwt. of copper coſt 4l. 18s. what quantity will 14s. buy at that rate?

s. lb. s.
If 98 buy 56, what 14? *Anſ.* 8 lb. of copper.

Example 5.

If 4 C. 3 qrs. of ſugar coſt 5l. 15s. 7d. what will 4 hhds. come to, weighing 42 C. 1 qr. 14 lb.?

lb. d. lb.
If 532—1387—4746? *Anſ.* 12373 pence, or 51l. 11s. 1d.; and the remainder 266, multiplied by 4, gives 1064, which alſo divided by the firſt number 1532 gives a halfpenny more; ſo the whole is 51l. 11s. 1½d.

Any

Any of these examples, or any other, may be proved by a back stating, according as the first example was proved; and each proof becomes another question in the rule of three, as we said before.

Example 6.

If I have 50l. a year salary, how much is due to me for 144 days service at that rate?

Days. l. Days.

If 365—50—144? *Ans.* £ 19—14—$6\frac{90}{365}$ parts of a penny.

In this example, the product of the third by the second number is 7200, which divided by the first 365 (according to the rule) quotes 19 pounds, the name of the middle number, and there is a remainder of 265; which, multiplied by 20, according to reduction, and the product still divided by 365, there comes out 14 shillings, and yet there is a remainder of 190, which multiplied by 12, and the product divided by 365, gives 6 pence, and there is a remainder of 90, which, if multiplied by 4 (the last inferior name) and divided by 365, yet would not come to a farthing more; so that the answer is as above £ 19—14—$6\frac{90}{365}$.

You are to note always, That when any thing remains that is reducible to an inferior or lower name, after multiplied as above, it must continually be divided by the first number.

Note also, When the first of the three given numbers is an unit, or 1, the work is performed, or answer found, by multiplication.

Example 7.

If I am to give 17s. for 1 lb. of Belladine silk, what must I give for 264lb. at that rate?

lb. s. lb.

If 1 —— 17 —— 264

17

Ans. 4488 or 22 l. 8s.

Example

Example 8.

If I buy 49 bags of hops, at 12*l.* 12*s.* 6*d.* per bag, what come they to at that rate?

Bag	*l.*	*s.*	*d.*	Bags.
	12	12	6	49
				7 and by 7
	88	7	6	
				7
	618	12	6	

The foregoing work is performed by the component parts, as taught in multiplication.

When the third or laſt of the three given numbers is an unit or 1, then the work is performed by diviſion.

Example 9.

If 12 ells of Holland coſt 3*l.* 6*s.* what is the price of 1 ell at that rate?

Ells. 12)	*s.*	Ell.	
If 12	66	1	*Anſ.* 5*s.* 6*d.*
	5 $\frac{6}{12}$ or 5*s.* 6*d.*		

Example 10.

If 56 yards of broad-cloth coſt 40*l.* 12*s.* what comes a yard to at that rate?

Yds. 7)	*l.*	*s.*	Yd.	
If 56	40	12	1	*Anſ.* 14*s.* 6*d.* per yd.
	8) 5	16		
	0	14	6*d.*	*Anſ.*

This example is wrought by diviſion of money, and by component parts, as before taught in the rule of diviſion.

Example 11.

If A owes B 296*l.* 17*s.* and compounds at 7*s.* 6*d.* in the pound, what muſt B take for his debt?

s.	*d.*	*s.*	
If 20	90	5937	*Anſ.* 111*l.* 6*s.* 4½*d.*

Example 12.

If a gentleman hath an eſtate of 500*l.* a-year, what may he expend daily, and yet lay up 12*l.* 15*s.* per month?

First.

Firſt multiply 12*l.* 15*s.* by 12, the months in a year, and it makes 153*l.* which deducted from 500*l.* the remainder is 347*l.* Then ſay,

Days. *l.*

If 365——347, what 1 day? *Anſ.* 19*s.*

After you have reduced the pounds into ſhillings, which makes 6940, your divide them by 365, and the quotient is 19*s.* a-day.

The Rule of Three Reverſe, or *of Indirect Proportion.*

WHAT Indirect Proportion is has been hinted already.

In Direct Proportion, the product of the firſt and fourth numbers is equal to the product of the ſecond and third.

But in this proportion, the product of the third and fourth numbers is equal to the product of the firſt and ſecond.

The method of ſtating any queſtion in this rule is the ſame with that of the direct rule.

For the firſt and third numbers muſt be of one name, or ſo reduced as in that rule; and the number that moves the queſtion muſt poſſeſs the third place; and the middle number will be of the ſame name with the anſwer, as it is there.

To know when the queſtion belongs to the direct, and when to the reverſe rule.

When the queſtion is ſtated, as above ſaid, conſider whether the anſwer to the queſtion ought to be more or leſs than the ſecond number; if more, then the leſſer of the firſt and third numbers muſt be your diviſor.

But if leſs, then the greater of the two extreme numbers muſt be your diviſor.

And if the firſt number of the three is your diviſor, then the proportion is direct; but if the laſt of the three is your diviſor, the proportion is indirect or reverſe.

Or, without regard either to direct or reverſe.

If more is required, the leſſer
If leſs, the greater } is the diviſor.

Examples

Examples for Explanation.

Example 1.

If 4 men plane 250 deal boards in 6 days, how many men will plane them in 2 days?

If 6 days require 4 men, what 2 days? *Anſ.* 12 men.

6

2)24

12 *Anſ.*

Example 2.

If a board be nine inches broad, how much in length will make a ſquare foot?

In B. In L.

If 12——12 what 9 inches broad?

12

0) 144

Anſ. 16 inches length.

In theſe examples, the firſt and ſecond numbers are multiplied together, and their product is divided by the third; for, in the firſt example, it is moſt certain, that two days will require more hands to perform the work than 6 days; therefore the leſſer of the extreme numbers is the diviſor; and declares the queſtion is in the indirect proportion.

Likewiſe, in the ſecond example, 9 inches in breadth muſt needs require more in length to make a foot, than 12 inches in breadth; wherefore it is in the ſame proportion with the firſt example, becauſe the diviſor is the third number.

Example 3.

How many yards of ſarcenet, of 3 qrs. wide, will line 9 yards of cloth of 8 qrs. wide?

qrs. wide *yds. long* *qrs. wide.*

If 8——9——3

8 Here the narrower the ſilk, the more in length is required

3)72

Yards 24 *Anſ.*

Example

Example 4.

If a quartern loaf weigh 4¾lb. when wheat is 5*s.* 6*d.* the buſhel; what muſt it weigh when wheat is 4*s.* the buſhel.

d.	*half lb.*	*d.*	*lb.*
If 66	9	48	*Anſ.* 6 $\frac{3}{10}$

Example 5.

If in 12 months 100*l.* principal gain 5 pounds intereſt; what principal will gain the ſame intereſt in 5 months?

M	*l. P.*	*M.*
12	100	5

12

5) 1200

Anſ. 240*l.* principal

The Double Rule of Three Direct.

IN this rule there are five numbers given to find out a ſixth, which is to be in proportion to the product of the fourth and fifth numbers, as the third number is to the product of the firſt and ſecond numbers.

Queſtions in this kind of proportion are wrought either by two operations in the Single Rule of Three Direct, or by the rule compoſed of the five given numbers, and the one may be a proof to the other; as may be ſeen in the example following:

Example.

If 100 pounds principal in 12 months gain 5 pounds intereſt; what will 246 pounds principal gain in months?

If 100 gain 5 what 246

5

1100) 12130

20

1100) 6100 *Anſ.* 12*l.* 6*s.*

M *l.* *s.*

Then ſay again, if 12 gain 12——6 what 7?

20

246

7

12) 1722

210) 1413.6

l. 7:3:6

In the firſt ſtating, the anſwer is, that if 100*l.* gain five pounds, then 246*l.* will gain 12 pounds 6 ſhillings.

Then I ſay in the next ſtating; if 12 months gain 12*l.* 6*s.* what will 7 months gain? and the anſwer is 7*l.* 3*s.* 6*d.* And ſo, how much will 246 pounds gain in 7 months, if 100 pounds gain 5 pounds in 12 months;

You muſt particularly note, That in all operations where the anſwer to the queſtion is found by two ſtatings of the Rule of Three, the anſwer of the firſt ſtating is ever the middle number of the ſecond ſtating; as in the preceding example.

The foregoing queſtion may be anſwered by a ſtating, compoſed of the five given numbers, thus:

(1) *l.*	(2) *M.*	(3) *l.*	(4) *l.*	(5) *M.*
If 100	12	5	246	7

12

1200

7

1722

5

1200) 8610 (7*l.*

8400

210

20

1200) 4200 (3*s.*

3600

600

12

1200) 7200 (6*d.*

7200

(0)

In this work, the ſtating the queſtion, the firſt and fourth numbers are made of one name, and the ſecond and fifth; then the two firſt numbers are multiplied together for a diviſor, the laſt three numbers are multiplied together for a dividend, and the quotient or anſwer is of the ſame name with the middle number, viz. pounds intereſt. In the work I find the firſt quotient 7 pounds intereſt; and ſo I proceed from one denomination to another, till I find the ſame anſwer, as in the work at two ſtatings, viz. *l.* 7—3—6.

This method of operation ſerves to anſwer all queſtions in the Double Rule of Three Direct.

The Double Rule of Three Reverſe.

IN this rule you muſt place your numbers in ſuch order, that your ſecond and fourth numbers may be of one name or denomination, and your third and fifth.

Example.

If 100*l.* principal in 12 months gain 6*l.* intereſt, what principal will gain 20*l.* intereſt in 8 months?

Stated thus:

l. P.	*Mo.*	*l. Int.*	*Mo.*	*l. Int.*
(1)	(2)	(3)	(4)	(5)
If 100	12	6	8	20

12 × 6 = 72 the diviſor.

1200 × 20 = 24000

72)24000 (500*l.* principal. *Anſ.*
240

(0)

In this work the third and fourth numbers are multiplied together for a diviſor; and then the firſt is multiplied by the ſecond, and that product by the fifth number, and the product 24000 is divided by 48, and the quotient is 500*l.* principal; which is the anſwer to the queſtion, as may be ſeen in the work.

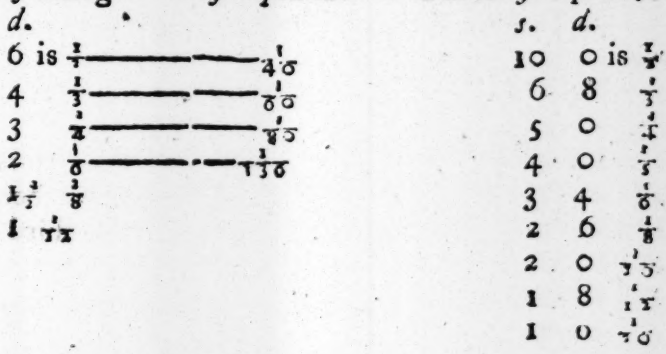
Rules of Practice.

THESE rules are ſo called from their frequent uſe and brevity in caſting up moſt ſorts of goods or merchandiſe.

Note, That any queſtion in the Rule of Three, when the firſt number in the ſtating is 1, is more briefly done by theſe rules, called Practice.

But previous to theſe rules, it is neceſſary to have the following tables by heart.

Parts of a ſhilling. *Of a pound.* *Parts of a pound.*



Example 1.

Parts of a ſhilling.

6*d.* is 1/2 of 1*s.* } 426 pounds of ſugar, at 6*d.* per lb.

210) 2113

l. 10 13 *Anſ.*

Here 6*d.* being the price of each lb. and the half of a ſhilling; therefore the half of 426 is taken, and gives 213*s.* or 10*l.* 13*s.*

Example 2.

4*d.* is 1/3 of 1*s.* } 512 lb. of cheeſe, at 4*d.* per lb.

210) 1710 8*d.*

l. 8 10 8 *Anſ.*

Here 4*d.* is 1/3 of a ſhilling; therefore the third part of 512 is 170*s.* and 2/3 of a ſhilling, or 8*d.* remains.

Note always, *That the remainder is of the ſame name with the dividend, which here is groats; for the pounds of the cheeſe are at a groat each.*

Example 3.

3*d.* is 1/4 of 1*s.* } 246 yards of ribband, at 3*d.* per yard.

210) 611 6*d.*

l. 3 1 6 *Anſ.*

Here the yards are divided by 4, becauſe 3*d.* is the 4th of a ſhilling; and it quotes 61 ſhillings; and 2 remains, or two 3 pences. So the anſwer is l. 3—1—6.

And thus may any propoſed queſtion be anſwered, be-

longing to the firſt table, or parts of a ſhilling, that is, by dividing the given number by the denominator of the fraction, and the quotient will be always ſhillings, which (the remainders being known as above) bring into pounds, by dividing by 20, &c.

When the price of the integer is at a farthing, a halfpenny, or three farthings more than the value of the pence mentioned. then for thoſe farthings take a proper part of the foregoing quotient found for the pence, and add them together.

Examples.

249 ells of canvas, at $4\frac{1}{2}$ per ell.

$4d.$ is $\frac{1}{3}$
$\frac{1}{2}d.$ is $\frac{1}{8}$
of $4d.$

83
$10\frac{3}{8}$ or $4\frac{1}{2}$ *Anſ.*

20) 913 $4\frac{1}{2}$

4 13 $4\frac{1}{2}$ *Anſ.*

In this example I divide by 3 for the groats, as being the third of one ſhilling, and it quotes 83*s.*; then I conſider that a halfpenny is the eighth of 4*d.* therefore I take the eighth part of the groat line, or 83*s.* and that produces 10*s.* and $\frac{3}{8}$ of a ſhilling, or $4\frac{1}{2}d.$ then the two lines being added together, make 93*s.* $4\frac{1}{2}d.$ or 4*l.* 13*s.* $4\frac{1}{2}d.$ as in the work.

Parts of a pound.

10*s.* is $\frac{1}{2}$ l 254 yards of cloth, at 10*s.* per yard.

l. 127 *Anſ.*

Here the half of 254 is taken, becauſe 10*s.* is the half of a pound.

s. *d.*
6 $8\frac{1}{3}$ | 972 gallons, at 6*s.* 8*d.* per gallon.

l. 324 *Anſ.*

Here the third part is taken, becauſe 6*s.* 8*d.* is the third of a pound; and the anſwer is l. 324

And thus may any queſtion propoſed be anſwered, belonging to the ſecond table, or parts of a pound; that is, by dividing the given number by the denominator of the fraction, and the quotient will always be pounds; and if any thing remains, it is always ſo many halves, thirds

thirds, fourths, or fifths, &c. of a pound, according to the denominator that you divide by.

If the price be ſhillings and pence, or ſhillings, pence, and farthings, and no even part of a pound, then multiply the given number by the ſhillings in the price, and take even parts for the pence, or pence and farthings, and add the ſeveral lines together, and they will be ſhillings; which ſhillings bring into pounds, as before.

Examples.

lb.	s.	d.
426	at 4	9
4		
1704		
213		
106½ or 6*d.*		
210) 2021	3.	6
l. 101	3	6

Ells.	s.	d.
216	at 2	3¼
2 per ell.		
432		
54		
9		
210) 4915	s.	
24	15	*Anſ.*

396 gallons of brandy, at 7s. 9d. per gallon.

	7
	2772
6*d.* ½ of 1s.	198
3*d.* ½ of 6*d.*	99
210)	30619
l.	153 9 *Anſ.*

When the price is 10*d.* only, annex 0 to the right of the given number, (which is multiplying by 10), and they are pence; which divide by 12 and by 20.

Example.

426l. of hops, at 10*d.* per lb.

12)	4260
210)	3515
l.	17 15 *Anſ.*

When the price is 11*d.* ſet down the quantity twice in the form of multiplication, and add the two lines together, then divide, by 12, and by 20.

Example.

426 lb. of copper, at 11*d.* per lb.

426

12) 4686 *Pence.*

2|0) 39|0 6

l. 19 10 6 *Anſ.*

If the price be 11½d. take half the uppermoſt line, &c.

Example.

942 lb. of tobacco, at 11½ per lb.

942

471

12) 10833 *Pence*

2|0) 90|2 9

l. 45 2 9 *Anſ.*

When the price is 1*s.* only, divide by 20.

Example. 2|0) 96|4 lb. of tobacco, at 12*d.* per lb.

l. 48 4 *Anſ.*

When the price is 2*s.* it is done at ſight, by doubling the laſt figure towards the right hand, and ſetting it apart for ſhillings; and the figures towards the left are pounds

Example.

596 gallons of ſpirits, at 2*s.* per gallon.

l. 59 12 *Anſ.* Here the double of 6 is 12, and the 59 are pounds.

From this method of working by 2*s.* a multitude of examples may be moſt expeditiouſly wrought, viz.

	Ells. 444 cambric, at 5*s.* 9*d.*		Yards. 426 at 3*s.* 6*d.* per yard.	
	44 8 at 2*s.*		42 12 at 2*s.*	
1*s.* ½ of 2*s.*	44 8 at 2*s.*	1*s.* ½ 2*s.*	21 6 at 1*s.*	
6*d.* ½ of 1*s.*	22 4 at 1*s.*	6*d.* ½ 1*s.*	10 13 at 6*d.*	
3*d.* ½ of 6*d.*	11 2 at 6*d.*			
	5 11 at 3*d.*		*Anſ.* l. 74 11 at 3*s.* 6*d.*	

Anſ. l. 127 13 at 5*s.* 9*d.*

The

The operation of these two examples is so intelligibly wrought, that there is no need of verbal explanation.

Again, 548 yards of broad cloth, at 12s. 6d. per yard.

l. 54 16 at 2s.
6 times 2s. is 12s.

6d. is $\frac{1}{2}$ of 2s. } 328 16 at 12s.
13 14 at 6d.

342 10 *Ans.*

Note, *That* 13l. 14s. *is the fourth part of* 54l. 16s. *the two shilling line.*

Or multiply by 12s. and take half of the given number for the 6d. thus:

548 yards
12

6576
$\frac{1}{2}$) 274

210)68510

l. 342 10 *Ans.*

When the price is an even number of shillings, multiply the given number of integers by half the price, and double the first figure of the product for shillings, and carry, as is usual in multiplication, and the other figures towards the left will be pounds.

Example.

296 yards of cloth, at 14s. per yard.
7 the half of 14s.

l. 207 4s. *Ans.*

Here 7 times 6 is 42; the double of 2s. is 4s. &c.

When the price is an odd number of shillings, work for the even number as above; and for the odd shillings take the $\frac{1}{20}$ of the given number, and add them together.

Example.

496 gallons of citron water, at 17s. per gall.
8 the half of 16.

l. 396 16
24 16

l. 421 12 *Ans.*

In

In this example I ſay, 8 times 6 is 48; the double of 8 is 16*s.* and carry 4; then 8 times 9 is 72, and 4 is 76, 6 and carry 7; and 8 times 4 is 32, and 7 is 39; then the half of 4 is 2, &c.

I have not here room to ſpeak of the various and almoſt infinite methods and rules of Practice (having ſeveral other ſubjects and things to treat on), but ſhall leave ſome general rules, which, if heedfully noted, will be of great uſe to learners, and are theſe, viz.

1. When the price is parts of a farthing, or of a penny, as $\frac{3}{4}$, $\frac{5}{6}$, $\frac{7}{8}$, &c. then multiply the integers by the numerator, and divide by the denominator, and the reſult will be either farthings or pence; which reduce to pounds, &c.

2. When the price is pence, and no even part of a ſhilling; as ſuppoſe 5*d.* 7*d.* 8*d.* or 9*d.* then it may be done by taking their parts, as 3*d.* and 2*d.* is 5*d.* and 4*d.* and 3*d.* is 7*d.* and 4*d.* and 4*d.* is 8*d.* and 6*d.* and 3*d.* is 9*d.* but it is an eaſy and ſure way to multiply the given number by 5, 7, 8, or 9, and then the product is pence; which reduce to pounds by Reduction.

3. When the price is pence, and parts of a penny; as $1\frac{1}{4}d.$ $2\frac{1}{3}d.$ or $6\frac{3}{4}d.$ then work for the penny by taking the $\frac{1}{12}$; for 2*d.* the $\frac{1}{6}$; and for 6*d.* the $\frac{1}{2}$; then for the farthings take $\frac{1}{4}$ of the penny line, and for $\frac{1}{3}$, $\frac{1}{4}$ of the two penny line; and for $\frac{3}{4}$, take $\frac{1}{8}$ of the 6-penny line, then add their reſults together, and the total will be ſhillings, which reduce to pounds by dividing by 20. Or by the ſure way of bringing the mixed number into the loweſt denomination; as $1\frac{1}{4}d.$ into 5 farthings; $2\frac{1}{2}d.$ into 5 halfpence; and $6\frac{3}{4}d.$ into 27 farthings; then multiply the integers by 5, and the product is farthings; or by 5 halfpence, and the product will be half-pence; or by 27 farthings, and the product will be farthings; which, whether farthings or pence, reduce to pounds, &c.

4. When the price is ſhillings and pence, or ſhillings, pence, and farthings, multiply the integers by the ſhillings of the price, and take parts for the pence, or pence and farthings, &c.

5. If the price be pounds and ſhillings, or pounds, ſhillings, pence, and farthings, multiply by the ſhillings in the price, that is in the pounds and ſhillings, and take parts for the pence and farthings.

6. When the number of integers hath a fraction annexed, or belonging to them; as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{3}{4}$, &c. then take $\frac{1}{2}$, $\frac{1}{3}$, or

⅓, or ¼, of the price of one of the integers, and add at to the other reſults.

TARE and TRETT, &c.

Groſs Weight is the weight of the goods in hundreds, arters, and pounds, with the weight of the hogſhead, ſk, cheſt, bag, bale, &c. that contains the goods.

Tare is allowed to the buyer for the weight of the gſhead, caſk cheſt, bag, bale, &c.

Trett is an allowance made for waſte, duſt, &c. in ſun- y ſorts of goods, as tobacco, cotton, pepper, ſpices, &c. d is always 4 lb. per 104 lb. ſuttle, and found by di- ding the ſuttle pounds by 26, becauſe 4 times 26 make 4 lb. When the groſs weight is brought into pounds, d before the tare is deducted, they are called Pounds roſs; and after the tare is ſubtracted, the remaining unds are called Pounds Suttle; which divided by 26, s ſaid before), quotes pounds trett, &c.

Tare at ſo much per *caſk, hogſhead, bag*, &c.

The allowances for tare are variouſly wrought, as by e following examples:

In 12 caſks of indigo, containing 45 C. 1 qr. 14 lb. roſs, tare 30 lb. per caſk, how many pounds nett?

12 Caſks.	*C. qr. lb.*
30	45—1—14
	45
360 Pounds tare.	
	45
	45142
	5082 Pounds groſs.
	Subtract 360 Pounds tare.
	Anſ. 4722 Pounds nett.

In this example the pounds tare of one caſk are multi- ied by the number of caſks, and the product is 360 lb. re; and the groſs weight reduced into pounds by the ethod ſhewn in reduction of weight, and then the pounds re are deducted from the pounds groſs, and the remain- r is pounds nett, viz. 4722, as in the work.

When the tare is at ſo much per cwt. multiply the mber of hundreds by the tare, and take part for the d weight, and add it to the tare found by multiplica-

tion,

tion, and divide it by 112 to bring it into groſs weigh
in order for ſubtraction.

Example. What is the nett wt. of 12 caſks of argo
84 C. 2. qrs. 14 lb. [wt. groſs
14 tare per C.

	C.	qrs.	lb.
336	84	2	14
84	10	2	8¼ Tare.
7 for half a C.			
1¾ for 14 lb.	74	0	5¼ Nett wt.

112) 1184¼ (10 C.
112

64 lb. or half a C. and 8 lb.

The tare in the laſt example is to be found by th
foregoing directions, 10 C. 2 qrs. 8¼ lb. which ſub
tracted, as in the work, leaves 74 C. 0 qrs. 5¼ lb. for th
nett wt.

But the foregoing example may be ſooner done b
Practice, thus:

	C.	qrs.	lb.	
14 lb. is ⅛ of C. 8)	84	2	14	Groſs.
ſub.	10	2	8¼	Tare.
	74	0	5¼	Nett.

In this method the groſs weight is divided by 8, be
cauſe 14lb. is one eight of 112lb. and the remainder i
reduced into the next inferior name, and ſtill divide
by eight, to the end, and then deducted as above, an
the nett weight is the ſame as by the other way. An
ſo may any tare per cent. be found, if the tare be a
even part of 112lb. as 14 is one eighth, and 7 lb. is th
half of that, and 16 lb. is one ſeventh, and 8 lb. is th
half of that, &c. that is, if the tare be at 7 lb. per C
find it for 14 lb. as before, and then take the half o
that for 7 lb. per C. tare, the like for 8lb. per C. tare
take one ſeventh for 16 lb. and then the half of th
for 8 lb. per C. tare.

Of TRETT.

What Trett is, when allowed, and how found, hath
been ſaid already; now I ſhall give an example fo
explanation, as follows:

Bough

Bought ſix hogſheads of tobacco, containing groſs d tare, as follows, viz.

No.		*C.*	*qrs.*	*lb.*	*lb.*
1	qt.	4	1	20	Tare 80
2		5	2	19	100
3		6	3	18	102
4		7	3	12	104
5		8	2	13	106
6		9	1	14	110
		42	3	12	602

Suttle.

3) 4198 (161 lb. trett.
26··

159
156

38
26

12

42
42
42196

4800 Pounds groſs.
ſubtract 602 Pounds tare.

4198 Pounds ſuttle.
deduct $161\frac{6}{13}$ Pounds trett.

$4036\frac{7}{13}$ Pounds nett.

There are ſome few other rules, ſuch as Barter, or exhanging goods for goods; alſo, exchange for coin, Pro, Loſs, &c. but all of them being done either by the ule of Three, or by Rules of Practice, it is therefore re unneceſſary to enlarge upon them.

Of FRACTIONS Vulgar and Decimal.

WHAT Fractions are hath already been hinted in the rule of diviſion, from whence they ariſe; for e remainder is a part of the dividend remaining undided; as admit 54*l.* is divided into twelve equal parts, e quotient is 4, and the remainder 6: So that here 6 mains as yet undivided by 12, and is therefore 6 parts 12, or ſix twelfths, equal to a half, for 6 is the $\frac{1}{2}$ of 2; and the remainders are uſually ſet down in this orm $\frac{6}{12}$: and when ſo, the expreſſion is called a Fraction, hoſe parts are underſtood by theſe names, viz.

6 *Numerator.*

12 *Denominator.*

The Numerator is above the ſhort line, and ſheweth the umber of parts ſignified by the fraction; and the Denominator

minator ſtands under the line, and declares the numbe parts into which the integer or whole number is divi as above 54*l.* is divided into 12 parts, and the quotie ſays there are 4 times 12 contained in 54, and 6 remai which is $\frac{6}{12}$ of a pound, or 10*s.* as above ſaid.

Fractions are thus ſet down and read, viz. $\frac{1}{4}$, o fourth; $\frac{1}{2}$, one-half, $\frac{1}{3}$, one-third; $\frac{1}{5}$; one-fifth; one-ſixth; $\frac{2}{3}$, two-thirds; $\frac{2}{4}$, two-fourths $\frac{2}{6}$, two-ſixth $\frac{5}{7}$, five ſeventhſ, &c.

Fractions are either proper or improper: A prop fraction hath its numerator leſs than the denominator, $\frac{5}{8}$, five-eighths; $\frac{24}{76}$, twenty-four fifty ſixths, &c.

An improper fraction hath its numerator greater th the denominator, as $\frac{7}{3}$, ſeven thirds; $\frac{48}{15}$, forty-eight f teenths, &c.

Again, fractions are either ſimple or compoun ſimple, when part of an integer or thing hath but o numerator, and one denominator; as $\frac{3}{4}$ of a pound ſterli $\frac{2}{4}$ of a hundred weight; $\frac{2}{3}$ of a tun; $\frac{5}{8}$ of a gallon, Compound is a fraction of a fraction, as the $\frac{1}{4}$ of $\frac{1}{2}$ o pound ſterling, which is equal to half a crown; or wh one is divided into any number of parts, and thoſe pa again ſubdivided into parts, &c.

Fractions are of two kinds, viz. Vulgar and Decim Vulgar fractions are as declared before. Decimal fr tions are artificially expreſſed, by ſetting down the num rators only, the denominators being underſtood, and a always an unit, with as many cyphers annexed as th are places in the numerator; and therefore muſt be eit 10, or ſome power of 10, as 100, 1000, 10,000, 100,000, &c.

Decimal fractions appear as whole numbers, (and in the general ſo wrought) but are diſtinguiſhed from th by a point or comma prefixed thus, ,5 is read five tenth ,32 thirty-two hundredths; and ,256 two hundred fift ſix thouſands: But of decimal fractions and their hereafter.

Reduction of vulgar fractions is to fit or prepare th for addition, ſubtraction, &c.

1 *To reduce a mixed number to an improper fraction.*

Rule.

Multiply the integer by the denominator, and take the numerator.

Exam

Example.

Reduce 12 gallons $\frac{3}{4}$ to an improper fraction, thus:

$$\frac{4}{51}$$ New Numerator.

Anſ. $\frac{51}{4}$ or 51 quarts.

2. *To reduce an improper fraction to a whole or mixed number.*

Rule. Divide the numerator by the denominator.

Example. Reduce the laſt example to a whole or mixed number, viz.

$$\frac{51}{4} \qquad 4\overline{)51}$$

12

3 remainder equal to $\frac{3}{4}$

Here 12 gallons is the whole number, $\frac{3}{4}$ the fraction, the ſame with three quarts.

3. *To reduce fractions to a common denominator.*

Rule. Multiply the numerator of each fraction into all the denominators, except its own, and the product will be a numerator to that fraction; and then do ſo by the next, &c.

Example.

Reduce $\frac{2}{3}$, $\frac{3}{4}$, and $\frac{5}{6}$ of any integer to a common denominator; ſay, twice 4 is 8, and 6 times 8 is 48, for a new numerator to $\frac{2}{3}$; then ſay, 3 times 3 is 9, and 6 times 9 is 54, for a new numerator to $\frac{3}{4}$; laſtly, ſay, 5 times 4 is 20, and 3 times 20 is 60, the numerator to $\frac{5}{6}$: Then to find the common denominator, ſay, 3 times 4 is 12, and 6 times 12 is 72, the common denominator, ſo that $\frac{48}{72}$, is equal to $\frac{2}{3}$, $\frac{54}{72}$ to $\frac{3}{4}$, and $\frac{60}{72}$ to $\frac{5}{6}$, which may be thus proved:

$\frac{2}{3}$ of a pound is *ſ.*	13	4	48	72) 162	($2\frac{18}{72}$ or $2\frac{1}{4}$
$\frac{3}{4}$ ditto	15	0	54	144	
$\frac{5}{6}$ ditto	16	8	60	18	

2l. 5ſ. or 45 0 $\frac{162}{72}$ common denominator.

Here the ſeveral numerators are added together, and they make 162; which placed over the common denominator 72, make the improper fraction $\frac{162}{72}$; and its value is found as before directed, in the rule for reducing an improper fraction to a whole or mixed number, as may be ſeen in the foregoing page.

4 *To reduce a fraction into its loweſt terms.*

Rule.

If there are even numbers, take half of the numerator, and denominator, as long as you can: And then divide

them by any digit-number, (*i. e.* 3, 4, 5, 6, &c.) that will leave no remainder in either.

Example.

Reduce $\frac{56}{84}$ into its loweſt terms: Say, the $\frac{1}{2}$ of 56 is 28, and the $\frac{1}{2}$ of 84 is 42, and then the $\frac{1}{2}$ of 28 is 14, and the $\frac{1}{2}$ of 42 is 21: So the fraction $\frac{56}{84}$ is reduced to $\frac{14}{21}$. And ſince they cannot be halved any longer; for though you can halve 14, yet you cannot 21, without remainder; try therefore to divide them by ſome other digit-number, and you will find that 7 will divide both numerator and denominator without any remainder; then ſay, the 7's in 14 twice; and the 7's in 21 three times: So the fraction $\frac{56}{84}$ reduced into its loweſt terms, will be $\frac{2}{3}$, two-thirds, which is of the ſame value as $\frac{56}{84}$. The work is done in this form:

2	2	7	
56	28	14	2
84	42	21	3

And the proof that $\frac{2}{3}$ is of the ſame value with $\frac{56}{84}$, will appear by multiplying any integer by the numerator of each fraction, and dividing by the denominator of each fraction.

Example.

Let the integer be 1*l.* ſterling, or 20*s.*

The fraction $\frac{2}{3}$

s.	
20	
2	
3)40	
13	4*d.*

The fraction $\frac{56}{84}$

s.	
20	
56	
84)1120(13*s.*	
84	
280	} 13*s.* 4*d.*
252	
28	
12	
336 (4*d.*	
336	
(0)	

Here

Here it is manifeſt, that by working a fraction in its loweſt terms, much time and figures are ſaved. In one operation, 20, the integer, is multiplied by 2, and the product 40 divided by 3, and there remains 1, or $\frac{1}{3}$ of a shilling, or a groat, as in the other work.

There are other methods of reducing a fraction into its loweſt terms; but none ſo ready as the foregoing, where it can be uſed.

5. *To reduce a compound fraction into a ſimple one of the ſame value.*

Rule. Multiply the numerators together for a new numerator, and the denominators together for a new denominator.

Example.

Reduce $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$ of a pound ſterling into a ſimple fraction: Say, twice 3 is 6, and 5 times 6 is 30, the numerator; then 3 times 4 is 12, and 6 times 12 is 72; the denominator; ſo $\frac{30}{72}$ of a *l.* is equivalent to $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$ of a *l.* Thus proved, $\frac{5}{6}$ of a *l.* is 16*s.* 8*d.* and $\frac{3}{4}$ of 16*s.* 8*d.* is 12*s.* 6*d.* and $\frac{2}{3}$ of 12*s.* 6*d.* is 8*s.* 4*d.* the anſwer: And multiply 20*s.* by 30, and dividing by 72, gives the ſame anſwer, as in the following work is plain.

```
   20
   30
  ---
72) 600 (8s.
    576
  ---
   24 remains   } 8s. 4d.
   12 multiply
  ---
72) 288 (4d.
    288
  ---
   (0)
```

6. *To find the value of any fraction, whether of coin, weight, or meaſure.*

Rule. Multiply the integer by the numerator, and divide by the denominator; and if any thing remains, multiply it by the number of units of the next inferior denomination.

Example.

What is $\frac{30}{72}$ of a pound, or 20*s.*? The operation of the foregoing example of proof to the compound frac-

tion of $\frac{3}{4}$ of $\frac{4}{5}$ of $\frac{5}{6}$, anſwers this queſtion, and need not be repeated.

Example.

Again, what is $\frac{5}{6}$ of a ton weight?

C.
20 the integer.
5 the numerator.

The denominator 6) 100

C. 16 4 remains.
4 qrs. 1 C.

6) 16

qrs. 2 4 remains.
28 lb. 1 qr.

6) 112

Anſwer,
16 C. 2 qrs. 18 $\frac{4}{6}$lb. 18$\frac{4}{6}$lb.

Here the integer 20 C. is multiplied by the numerator 5, and the product 100, divided by the denominator 6, and the remainder 4 is multiplied by the parts of the next inferior denomination, &c. and the anſwer is 16 C. 2 qrs 18 lb. $\frac{4}{6}$ or $\frac{2}{3}$ of a pound weight, as in the work.

Addition of Vulgar Fractions.

IF the fractions to be added have a common denominator, add the numerators together for a numerator, and place it over the common denominator.

Example.

Add $\frac{1}{5}$, $\frac{3}{5}$, and $\frac{4}{5}$ of a pound ſterling together: Say 1 and 3 is 5, and 4 is 9, the numerator, which place over the common denominator, thus, $\frac{9}{5}$; and this improper fraction $\frac{9}{5}$ is in value 36*s.* for 9 times 4*s.* (the 5th of a pound) is 36*s.* for if the numerator 9 be divided by the denominator 5, I ſay the 5's in 9 once, and 4 remains, which is $\frac{4}{5}$ of a pound, or 16*s.*

5)9
l. 1

But if the fractions to be added have unequal denominators, then they muſt be reduced to a common denominator, by the rule before ſhewn, before addition can be made; and then proceed as above.

2. Whe

2. When mixed numbers are to be added, work with the fractional parts as before, and carry the fractional value to the whole numbers.

Example.

Add $25\frac{3}{4}$ to $12\frac{1}{4}$ thus: $25\frac{3}{4}$
$12\frac{1}{4}$

l. 38 *Anſ.*

Here 1 and 3, the numerators, make 4; and $\frac{4}{4}$ is 1, and 2 is 3, and 5 makes 8; and 1 and 2 is 3, and the anſwer is 38.

Or they may be reduced into improper fractions, thus:

$25\frac{3}{4}$	$12\frac{1}{4}$	103
4	4	49
103	49	4) 152
4	4	38 pounds.

Here the numerators are added, and their total is 152; which divided by 4, the common denominator, quotes 38 pounds, the ſame anſwer as above.

3. When compound fractions are to be added to ſimple ones, reduce the compound fraction to a ſimple one, as before directed; and then proceed as above.

Example.

Add $\frac{2}{8}$ and $\frac{3}{8}$ to $\frac{1}{2}$ of $\frac{3}{4}$ of a pound; thus, twice 2 is 4 and 4 is 8, therefore $\frac{2}{8}$ is equal to the compound fraction; then add, ſaying, 2 and 3 is 5, and 2 is 7, the new numerator, and $\frac{7}{8}$ equal in value to 17*s.* 6*d.* will be the anſwer.

Subtraction of Vulgar Fractions.

IN this rule the fractions muſt have a common denominator, or be reduced to one, before deduction can be made.

Example.

What is the difference betwixt $\frac{1}{4}$ and $\frac{3}{4}$? Anſwer $\frac{2}{4}$ which may be proved by addition; for $\frac{1}{4}$ and $\frac{2}{4}$ makes $\frac{3}{4}$.

Note, The difference between the numerators is the difference of the fractions.

Again, from $\frac{3}{4}$ of a pound, take $\frac{5}{12}$; here the fractions are to be reduced to a common denominator; 36 is the firſt numerator, and 20 the ſecond numerator, their difference is 16; and 48 is the common denominator; ſo that $\frac{16}{48}$, or $\frac{1}{3}$ in its loweſt terms, is the difference between $\frac{1}{4}$ of a pound, and $\frac{5}{12}$ of a pound.

To ſubtract a compound fraction from a ſimple one.

Rule. Reduce the compound fraction to a ſimple one, and then work as before.

Example.

From $\frac{13}{14}$ take $\frac{2}{7}$ of $\frac{8}{9}$; ſay twice 8 is 16, and 3 times 9 is 27, therefore $\frac{16}{27}$ is equal to the compound fraction; Then $\frac{13}{14}$ and $\frac{16}{27}$ muſt be reduced to a common denominator, thus: 13 times 27 is 351, the firſt numerator; 16 times 14 is 224, the ſecond numerator; and 14 times 27 is 378, the common denominator. Then ſubtract 224, the ſecond numerator, from 351, the firſt numerator, and the remainder is 127, which place over 378, the common denominator, thus: $\frac{127}{378}$ *Anſ.*

When a ſimple fraction is to be deducted from a whole number.

Rule. Subtract the numerator of the fraction from the denominator, and place the remainder over the denominator, and carry 1 to ſubtract from the whole number.

Example.

From 12*l.* take $\frac{5}{8}$ thus, ſay 5 (the numerator) from 8 (the denominator), and there remains 3, which place over the denominator 8, thus $\frac{3}{8}$; then 1 from 12 and there remains 11. So the anſwer is *l.* 11 $\frac{3}{8}$, or *l.* 11 7 6

Multiplication of Vulgar Fractions.

Rule. MULTIPLY the numerators into one another for the numerator of the product; then do the ſame by the denominators, for the denominator of the product.

Example.

Multiply $\frac{3}{4}$ of a pound, by $\frac{5}{6}$ of ditto; ſay, 3 times 5 is 15, the numerator; and 4 times 6 is 24, the denominator; ſo the anſwer is $\frac{15}{24}$, or, in its loweſt terms $\frac{5}{8}$.

You are to note, That multiplication in fractions leſſens the product, though in whole numbers it augments it; for above $\frac{1}{2}$, or 12*s.* 6*d.* is leſs than $\frac{5}{8}$ or 16*s.* 8*d.* and alſo leſs than the other fraction $\frac{3}{4}$ or 15*s.* The reaſon of which I have not here room to inſiſt on; but it is given in my Arithmetic, in multiplication of vulgar fractions; to which book I refer the reader for that and ſundry enlargements in the ſeveral rules of the ſcience of arithmetic.

2. *To multiply a whole number by a Fraction.*

Rule. Multiply the integer by the numerator of the fraction, and place the product over the denominator.

Exampl

Example. Multiply 56*l.* by $\frac{3}{4}$

56
3
168
4 } *Facit.*

This improper fraction $\frac{168}{4}$ reduced according to rule, makes but 42*l.* which is leſs than 56; and confirms what was above aſſerted, viz. that multiplication of fractions leſſens the product, &c.

3. *To multiply a ſimple by a compound fraction.*

Rule. Reduce the compound fraction to a ſimple one, as before taught, and work as above.

Example.

Multiply $\frac{6}{8}$ of a pound by $\frac{1}{2}$ of $\frac{3}{4}$ of a pound, ſay, 6 times 6 is 36, and 8 times 12 is 96. So that the anſwer is $\frac{36}{96}$ or $\frac{3}{8}$ in its loweſt terms; equal to 7*s* 6*d.*

Diviſion of Vulgar Fractions.

Rule. MULTIPLY the numerator of the diviſor into the denominator of the dividend, and the product is the denominator of the quotient; and then multiply the denominator of the diviſor into the numerator of the dividend, and the product will be the numerator of the quotient.

Example. Divide $\frac{15}{16}$ by $\frac{2}{3}$.) $\frac{45}{32}$ quotient.

Here 16 multiplied by 2, gives 32; and 15 by 3, gives 45; ſo that the quotient is $\frac{45}{32}$, equal to $1\frac{13}{32}$, as in the work.

Again, ſuppoſe $\frac{7}{16}$ was divided by $\frac{7}{11}$ the quotient will be $\frac{77}{77}$ equal to 1 integer, or whole thing. And ſo for any other example.

Reduction of Decimal Fractions.

WHAT a Decimal Fraction is hath been already ſhewn. The next ſtep is, how to reduce a vulgar fraction into a decimal: which is no more then to annex cyphers at diſcretion (that is 2, 3, or 4, &c.) to the numerator, and then divide it by the denominator.

Example 1. Reduce $\frac{3}{4}$ of a pound ſterling to a decimal.

4) 3,00
,75 } that is 75 hundredths, equal to 3 qrs. of any thing, whether money, weight, meaſure, &c.

as

as being $\frac{1}{4}$ of 100; and ſo 25 hundredths is, in decimals, the quarter of any thing, as being $\frac{1}{4}$ of 100; and five tenths expreſſes the half of any thing, as being the $\frac{1}{2}$ of 10.

In reduction of decimals ſometimes it happens that a cypher or cyphers muſt be placed to the left-hand of the decimal, to ſupply the defect or want of places in the quotient of the diviſion.—In this caſe always remember, that as many cyphers as you annex to the denominator of the vulgar fraction, ſo many places you muſt point off in the quotient towards the left-hand; but if there be not ſo many places to point off, then you muſt ſupply the defect by placing a cypher or cyphers to the left of the decimal.

Example 2.

Reduce $9\frac{1}{2}$ or $9\frac{2}{4}$ to the decimal of a pound ſterl. thus:

240) 9,0000 (,0375
720.
1800
1680
1200
1200
(0)

Here are but three places in the quotient, viz. 375; and therefore I cannot point off 4 for the 4 cyphers annexed to 9; therefore I prefix o to the left of the quotient, 375, thus, ,0375, and then it is 375 ten thouſandth parts of an integer.

The more cyphers you annex, the nearer you bring your decimal to the truth: but in moſt caſes, four cyphers annexed are ſufficient. But when you are to reduce $\frac{1}{2}$, $\frac{1}{3}$, or $\frac{1}{4}$ (as above) of an integer to a decimal, or any number of ſhillings to a decimal of a pound, two cyphers are ſufficient. One example more:

Example 3.

Reduce 3 farthings to the decimal of a pound, that is, the vulgar fraction $\frac{3}{960}$, 960 farthings being a pound.

960) 3,c0000 (,003125. The work being preformed according to the diviſion with two cyphers prefixed, quotes, ,003125, or 3125 ten hundred thouſandth parts of a pound. By the ſame method, the vulgar fraction of weight, meaſure, &c. are reduced to decimals.

Example 4.

How is 12 pounds weight expreſſed in the decimal of 1 C. weight Avoirdupois, or 112 *lb.* the vulgar fraction is $\frac{12}{112}$, and the decimal ,1071 found as before, thus:

112)

112) 12,0000 (,1071
112
80 &c.

The remainder 48 is not worth notice being leſs than 10,000th part of an unit or 1.

Example. 5.

How is 73 days brought to the decimal of a year? vulgarly thus expreſſed $\frac{73}{365}$.

365) 73.0 (,2 *Anſ.* 2 tenths.
730
(0)

Thus proved, 36,5
36,5
73.

Here 365, the days in a year, is divided by 10 twice; and the quotients added together, and they make 73 days.

Valuation of Decimals.

TO find the value of a decimal fraction, whether of coin, weight, meaſure, &c.

Rule. Multiply the decimal given by the units contained in the next inferior denomination, and point off as many places from the right hand as you have in your decimal; ſo thoſe figures towards the left of the point are integers or whole numbers; and thoſe on the other ſide towards the right hand are parts of one or unity: that is, ſo many tenths, hundredths, thouſandths, or ten thouſandths of one of thoſe integers, whether a pound, a ſhilling, or a penny, &c. or of a ton, a hundred, a quarter, or a pound weight, &c. And ſo of any other integer, or of what kind or quality ſoever.

Examples.

,476 Parts of a pound ſterling.
20 Shillings a pound.

9,520
12 Pence 1 ſhilling.

Anſ. 6,240
4 Farthings 1 penny.

9*l.* 6*d.* 960 parts, of $\frac{1}{4}$ of 1*d.*

,960 Parts, or almoſt $\frac{1}{4}$ of 1*d.*

,476

,476 Parts of a ton wt.
20 C. 1 ton.

9,520
4 qrs. 1 C.

2,080
28 lb. 1 qr. of C.

2,240

Anſ.
9 C. 2 qrs. 2 lb. 240 parts.

In the example of money, I multiply the fraction by 20, and point off 520 for the three places in the decimal, &c. and the anſwer is 9*s.* 6*d.* $\frac{1}{4}$ nearly.

In the example of weight I proceed as in that of money, (the fraction being the ſame) but with different reſpect to the inferior denominations; and the anſwer is 9 C. 2 qrs. 2 lb. $\frac{240}{1000}$ of a pound wt.

To find the value of a decimal in money in a briefer method, viz.

Rule. Always account the double of the firſt figure (to the left hand) for ſhillings; and if the next to it is 5, reckon 1 ſhilling more; and whatever is above 5, call every one ten; and the next figure ſo many ones as it contains; which tens and ones call farthings; and for every 24, abate 1: as admit the laſt example of money, viz. 476; the double of 4 is 8; and there being one 5 in 7, (the next figure), I reckon 1*s.* more, which makes 9*s.* and there being 2, (in the 7 above 5) they are to accounted 2 tens, or 20; which with the next figure 6 being ſo many ones, making 26 farthings; and abating 1 for 24, they gave 6*d.* and a farthing more.

Addition of Decimals.

IS the ſame in operation as in whole numbers; only in ſetting down, care muſt be taken that the decimal parts ſtand reſpectively under like parts; that is, primes under primes, ſeconds under ſeconds, thirds under thirds, &c. and the integers ſtand as in whole numbers.

Example.

Example.

Integers.	Thirds	Seconds	Primes	Parts	Primes	Seconds	Thirds	Fourths	Fifths
2 4 6	,4	2	6	,4 7 9 0	,4	7	9	6	2
7 4	,4	2		,4 2	,0	6	4	2	
9	,0	6		,0 7 6	,0	0	6		
6 5	,7	9	4	,0 0 0 4	,7				
4 2	,0	0	5	,5	,9				
43 7	,7	0	5	1,4 7 6 0	2,1	4	9	8	2

Note, There muſt be as many places pointed off, as there are in that number which has moſt decimal-places.

The caſting up of the foregoing examples, is the ſame with the addition of one denomination, in whole numbers: the total of the firſt (ſuppoſing them pounds ſterling) is 437*l.* and ,705 parts. The ſecond is 1*l.* and ,4760 parts. And the third is 2*l.* and ,14982 parts.

Subtraction of Decimals.

THE numbers muſt be placed as before in addition, and then proceed as in ſubtraction of numbers of one denomination.

l. pts.	*l. pts.*	*l. pts.*
46,51	140,42	4762,0
9,24	91,7462	0,472
37,27	48,6738	4761,528

Multiplication of Decimals.

HERE the placing the numbers and the operation is the very ſame as in the whole numbers; remember only to point off, towards the right hand, ſo many places for decimals, as you have decimal places in both multiplicand and multiplier.

Examples.

(1)	(2)	(3)
24,6	4602	,2796
2,5	,075	26
1230	23010	16776
492	32214	5592
61,50	345,150	7,2696

(4)	(5)	(6)
,07214	,083	4,25
,006	,16	1,09
,00043284	498	3825
	083	4250
	,01328	4,6325

Note, That where there are not a competent numbe of figures or places to point off, ſuch defect is ſupplie with cyphers to the left hand; as in the 4th and 5t examples, according to what was before hinted in re ducing a vulgar fraction to a decimal.

Diviſion of Decimals.

IS the ſame in operation as in whole numbers; th only difficulty is to know how many decimal place to point off towards the left hand of the quotient; t which end remember this rule: Obſerve how man decimal places there are in the diviſor, and in the div dend, and find the difference; and whatſoever it is, many places muſt be pointed off to the right hand of t quotient.

Examples.

Divide 12,345670 by 6,789) 12,345670 (1,8
6789 · · ·

In this example the dividend hath three decimal places more than the diviſor, wherefore I point off three places to the right hand of the quotient, viz. 818; ſo the quotient is 1 integer, and ,818 parts.	55566 54312 12547 6789 57580 54312 (3268)

Div

Divide, 3,46000 by 1,23) 3,46000 (2,813
246...
1000
984
160
123
370
369
(1)

Here the difference between the decimal places in the diviſor and the dividend is three places, as in the foregoing examples; therefore, ,813 is pointed off for the decimal fraction, and the quotient is 2 integers, and ,813 thouſandths of an integer.

Thus much for fractions vulgar and decimal; wherein I have been as conciſe as poſſible, and worked with as much plainneſs as I could invent.

BOOK KEEPING.

THE next qualification to fit a man for buſineſs, after Arithmetic, is the art of Book-keeping, or Merchants Accounts, after the Italian manner, by way of double entry.

It is not without good reaſon that moſt people of buſineſs and ingenuity are deſirous to be maſters of this art; for if we conſider the ſatisfaction that naturally ariſeth from an account well kept, the pleaſure that accrues to a perſon by ſeeing what he gains by each ſpecies of goods he deals in, and his whole profit by a year's trade; and thereby alſo to know the true ſtate of his affairs and circumſtances, ſo that he may, according to diſcretion, retrench or enlarge his expences, &c. as he ſhall think fit.

This art of Book-keeping, or Merchants Accounts, is talked of by many, but truly underſtood but by very few: for every petty ſchoolmaſter in any bye corner, will be ſure to have Merchants Accounts expreſſed on his ſign, as a principal article of his ability in teaching; though, ſtrictly ſpeaking, for want of the practical part, he knows hardly any thing of the matter, and is conſequently incapable of teaching it.

Inſtructions, notes, rules, and directions, for the right ordering and keeping Merchants Accounts, *by the excellent order of charge and diſcharge; commonly called* debtor *and* creditor.

Of the Books in uſe.

THE books of principal uſe are the Waſte-book, (by ſome called the Memorial) Journal, and Ledger.

Waſte-book.

IN this book muſt be daily written whatever occurs in the way of trade; buying, ſelling, receiving, delivering, bargaining, ſhipping, &c. without omiſſion of any one thing, either bought or ſold, borrowed, &c.

The Waſte-book is ruled with one marginal line, and three lines for pounds, ſhillings, and pence, and the day of the month, and year of our Lord, is inſerted in the middle of the page. In this book, any one may write, and, on occaſion, any thing may be blotted out, if not well entered, or any error be made.

JOURNAL.

INTO this book every article is brought out of the Waſte-book, but in other terms, in a better ſtyle, and in a fairer hand, without any alteration of cyphers or figures; and every parcel, one after another, are promiſcuouſly ſet without intermiſſion, to make the book, or ſeveral entries of it, of more credit and validity in caſe of any law-diſpute, or any other controverſy that may happen between merchant and merchant. In this book you are to diſtinguiſh the Debtor and Creditor, (or in other terms, the Debit and Credit.) And to this book you muſt have recourſe for the particulars of an account, which in the Ledger, are entered in one line. In this book alſo the day of the month is uſually placed in the middle of the page; it is ruled with double marginal lines, for references to the Ledger, and with three lines for *l. s. d.* as the Waſte-book

Of the LEDGER.

FROM the Journal or Day-book, all matters or things are poſted into the Ledger, which by the Spaniards, is called *El libro grande*, as being the biggeſt book, or chief of accounts. The left hand ſide of this book is called the Debtor, and the right the Creditor ſide

ſide; and the Numbers or Folios of each ſide muſt be alike, as 45 Debtor, and alſo 45 Creditor. The day of the month (in this book) is ſet in a narrow column on the left hand, and the month on the left of that: but where I keep books, the number in the narrow column referred to the journal-page, and the month and day was placed in the broad column, to the right of that; and at the head of each folio is the name of the place of reſidence, and the year of our Lord; as thus;

London, anno ——— 1788.

But the example of theſe ſeveral books hereafter following, will make the foregoing hints of them much more intelligible.—The following is a general rule, upon which moſt of the entries in book-keeping depends, viz.

All things Received, or the Receiver, are Debtors to the Delivered or the Deliverer.

Waſte-book entry.

London, January 1, 1788.

	l.	s.	d.
Bought of William Wilkins, of Norton Folgate, 120 yards of white ſarcenet, at 2s. 3d. per yard, to pay in 2 months.	13	10	—

The Journal entry of the ſame.

Wrought ſilk debtor to William Wilkins, 13l. 10s. for 120 yards of white ſarcenet, at 2s. 3d. per yard, to pay in 2 months. *In this example the wrought ſilks are received, and therefore debtor to William Wilkins the deliverer.*	13	10	—

Again,

Waſte-book entry.

January 4.

Sold Henry Harrington 246lb. nett of indico, at 6s. 6d. per lb. to pay in 3 months.	79	19	—

Journal entry.

Henry Harrington Dr. to indico, for 246 lb. nett, at 6s. 6d. per lb. to pay in 3 months.	79	19	—

Once more.

Waſte-book entry.

Bought of George Goodinch, ſen. viz.

		l.	s.	d.
Cheſhire cheeſe 430 C. ½ at 23s. 4d. per C. —	}	l. 502	5	
Butter 50 firkins, qt. nett 2800 lb. at 3d. per lb.	}	l. 35	0	
To pay at 6 months. - -				537 5

Journal entry.

Sundry accounts Dr. to Geo. Goodinch, l. 537 5 viz.

4 —	Cheſh. cheeſe, for 430 C. ½, at 23s. 4d. per C.	}	l. 502	5	
5	Butter, for 50 firkins, qt. nett 2800 lb. at 3d. per lb.	}	l. 35	0	
	To pay in 6 months. - -				537 5

Waſte-book.

Sold James Jenkins, viz.

White ſarcenet 50 yards, at 3s. per yard, -	}	7	10	0
Indico 50 pounds, at 7s. per pound, - -	}	17	10	0
				25

Journal entry of the laſt.

6 —	James Jenkins debtor to ſundry accounts, viz.				
7	To white ſarcenet, for 50 yards, at 3s. per yard, - - -	l.	7	10	0
	To Indico, for 50 lb. at 7s. per lb. - - -		17	10	0
					25

From theſe few examples of entry, it may be obſerved that an experienced perſon in accounts, and a good writer, may keep a Journal without a Waſte-book, or a Waſte-book without a Journal, ſince they both import one and the ſame thing, though they differ a little in words or expreſſing.

But however, I ſhall give methods of keeping each as far as room will give me leave.

(1)

The Waſte-book.

London, January 1. 1788.

An inventory of all the money, goods, and debts, belonging to me, A. B. *of London, merchant,* viz.

				l.	s.	d.
In caſh,		3500	0 0			
In tobacco, 4726 lb. at 9d. per lb.		177	4 6			
In broad cloth, 6 pieces, at 50s. per piece,		15	0 0			
Dowlas, 1000 ells at 2s. 4d. per ell,		126	13 4			
Canary wines, 9 pipes at 30l. per pipe,		270	0 0			
Due to me from Henry Bland, per bond.		60	0 0			
				4138	17	10

(1)

Journal.

Inventory, &c.

1	Sundry accts. Dr. to ſtock viz.	4138	17 10			
	Caſh	3500	0			
1	Tobacco, for 4726 lb. at 9d. per lb.	177	4 6			
1	Broad cloth, for 6 pieces at 50s. per piece,	15	0 0			
1	Dowlas, for 1000 ells, at 2s. 4d. per ell,	126	13 4			
	Canary wines, for 9 pipes, at 30l. per pipe,	270	0 0			
3	Henry Bland due on bond,	60	0 0			
				4138	17	10

I ſhall make one page ſerve for Waſte-book and Journal entries, to ſave room, and alſo to have both methods of entry under eye, to make them more intelligibly uſeful to the reader, he hereby being not obliged to turn over the leaf to ſee their difference of entry.

(2)

Waſte-book.

London, January 1. 1788.

				l.	s.	d.
Owing to William Web, by note of my hand,	50	0	0			
Ditto to Roger Ruff, the balance of his account,	16	12	4			
Ditto to Henry Hern, due the 4th of May next,	62	0	0			
				128	12	

Journal.

1	Stock debtor to ſundry accounts, l. 128 12 4 viz.						
3	To William Web, by note of my hand,	50	0	0			
4	To Roger Ruff, for the balance of his account,	16	12	4			
5	To Henry Hern, due the 4th of May next,	62	0	0			
					128	12	

Waſte-book.

London, Feb. 2. 1788.

				l.	s.	d.
Sold Thomas Townſhend, viz.						
246 lb. of Virginia cut tobacco, at 14d. per lb.	14	7	0			
460 ells of dowlas, at 3s. per ell,	69	0	0			
				83	7	

Feb. 2.

Journal.

Thomas Townſhend Dr. to ſundries, viz

6	To tobacco, for 246 lb. at 14d. per lb.	14	7	0			
1	To dowlas, for 460 ells, at 3s. per ell,	69	0	0			
					83	7	

Waſt

		l.	s.	d.
	Waſte-book.			
	Ditto 24.			
	Bought of Leonard Legg, four pipes of Canary, at 28l. per pipe, to pay in ſix months.	112		
	Ditto 24.			
	Journal.			
1	Canary wines Dr to Leonard Legg, for 4 pipes, at 28l. per pipe,			
2	to pay in 6 months.	112		

The ſhort lines ruled againſt the Journal entries are, or may be, termed Poſting Lines, and the figure on the top of the lines denotes the folio of the Ledger where the Debtor is entered, and the figure under the line ſhews the folio of the Ledger where the Credit is entered; and the other ſmaller figures againſt the ſundry Debtors, or ſundry creditors, (whether goods or perſons) ſhew alſo in what folios of the Ledger they are poſted.

The accounts of perſons and things are kept in the Ledger, on oppoſite pages, in which thoſe in which the Journal are ſaid to be Debtors are entered on the left-hand page, with the word *To*, and thoſe to which they are ſaid to be Creditors are entered on the right-hand page, with the word *By*.

For inſtance, the laſt Journal entry ſhould be poſted on the left hand, or Debtor-ſide, of the account of Canary wines, thus:

1788.
Feb. 24. To Leonard Legg 4 pipes 112 0 0

And the ſame ſhould be poſted on the right-hand, or Creditor-ſide, of the account of Leonard Legg, thus:

1788.
Feb 24. By Canary wines, to pay in 6 months, 112 0 0

There are ſeveral other books uſed by merchants beſides thoſe three before mentioned; as the Caſh-book, which is ruled as the Ledger, and folioed likewiſe, wherein all receipts of money are entered on the left hand folio, and payments on the right; ſpecifying in every entry the day of the month, (the year being ſet on the top) for what, and for whoſe account the money was received or paid; and the total debit or credit of each ſide is to be poſted into the Ledger to the account

of

of caſh therein in one line of either ſide, viz. To, or by ſundry accounts, as per Caſh-book, folio, &c. which is to be done once a-month, or at diſcretion; and the particulars of each ſide, article by article, are to be poſted into the Ledger to the proper accounts unto which they belong, with references in the Caſh-book to the ſeveral folios in the Ledger; and carry the balance over leaf into the Caſh-book; by which you may know at any time what caſh you have, or ought to have, by you.

Another book is a book of Charges of Merchandiſe, wherein is to be entered the cuſtom and petty charges of any goods ſhipped, as porterage, wharfage, warehouſe-room, &c. which once a month is transferred into the Caſh-book on the Credit-ſide, making reference to the book of charges of merchandiſe; and likewiſe the ſame in the debter-ſide of the ſame account in the Ledger, for the amount thereof.

The next book I ſhall name is the Invoice-book, or Book of Factories. In this book is to be copied all invoices of goods ſhipped, either for accounts proper or portable; and alſo of goods received from abroad, which muſt always be entered on the left ſide, leaving the right ſide blank; and, on the advice of the diſpoſal of goods ſent abroad, and alſo on the ſale of goods received from abroad, enter them on the blank or right ſide; ſo at firſt view may be ſeen how the account ſtands, &c.

The next is a Bill-book, wherein are entered bills of exchange accepted, and when they become due; and when paid, they ſhould be marked ſo in the margin.

The next is a Book of Houſehold-expences, for the monthly charge ſpent in houſe-keeping; likewiſe apparel, houſe-rent, ſervants wages, and pocket-expences: and this may be monthly ſummed up, and carried to the credit of Caſh.

Beſides thoſe above mentioned, there muſt be a book to copy all letters ſent abroad, or beyond the ſeas; wherein the name of the perſon or perſons to whom the letter is ſent muſt be written pretty full, for the readier finding the ſame.

The next, (and what is very neceſſary), a Receipt-book wherein are given receipts for money paid, and expreſſed for whoſe account or uſe, or for what it is received; to which

which the receiving perſon muſt ſet his name for himſelf, or ſome other, with the year and day of the month on the top.

Laſtly, A Note or Memorandum-book, to minute down affairs that occur, for the better help of memory; and is of great uſe where there is a multiplicity of buſineſs.

Having given an account of the ſeveral books, and their uſe, the next thing neceſſary will be to give ſome few rules of aid, to enable the book-keeper to make proper entries, and to diſtinguiſh the ſeveral debtors and creditors, viz.

Firſt, For money received, make Caſh Dr to the party that paid it, (if for his own account) and the party Cr.

Secondly, Money paid, make the Receiver Dr. (if for his own account) and Caſh Cr.

Thirdly, Goods bought for ready money, make the goods Dr to Caſh, and Caſh Cr by the goods.

Fourthly, Goods ſold for ready money, juſt the contrary, *i. e.* Caſh Dr. and the goods Cr.

Fifthly, Goods bought at time; goods bought are Dr. to the ſeller of them, and the ſeller Cr. by the goods.

Sixthly, Goods ſold for time juſt the contrary, *i. e.* the party that bought them is Dr to the goods, and the goods Cr by the party.

Seventhly, Goods bought, part for ready money, and the reſt for time; firſt make the Goods Dr to the party for the whole: ſecondly, make the party Dr to Caſh for the money paid him in part of thoſe goods.

Eighthly, Goods ſold, part for ready money, and the reſt for time; firſt make the party Dr to the goods for the whole; ſecondly, Caſh Dr to the party received of him in part of thoſe goods.—Or either of theſe two laſt rules may be made Dr to ſundries; as Goods bought Dr to the ſelling man, for ſo much as is left unpaid, and to Caſh for ſo much paid in ready money; and ſo on the contrary, for goods ſold.

Ninthly, When you pay money before it is due, and are to have diſcount allowed you, make the perſon Dr to Caſh for ſo much as you pay him, and to Profit and Loſs for the diſcount; or make the receiving man Dr to ſundries, as before.

Profit

Profit and Loſs is Dr.

To Caſh for what money you pay, and have nothing for it, as diſcount of money you received before due, and for abatement by compoſition, houſehold-expences, &c.

Per contra Cr.

By Caſh for all you receive, and deliver nothing for it; as diſcount for prompt payment, and legacy left you, money received with an apprentice, and by the profit of every particular commodity you deal in, by ſhips in company, by voyages, &c.

To balance or clear an account when full written.

FIRST, if the Dr ſide be more than the Credit, make the old account Cr by the new; and if the contrary, make the new account Dr to the old: but if the Dr ſide be leſs than the Credit, then make the old account Dr to the new, and the new account Cr by the old, or ſuch a reſt or ſum as you ſhall find in the account.

2. An account of company, wherein you have placed more received of another than his ſtock; then add as much on the Debit-ſide as you find on the Credit-ſide; to the end that, in the new account, you may have ſo much Debit as you put in, and ſo much Credit as you have received.

3. In account of merchandiſe, you muſt enter the gain or loſs, before you make the old account Cr by the new, and the new Dr to the old, for the remainder of goods unſold.

4. In the foregoing accounts, which you are to keep with a double column, for the dollars, crowns, or other foreign coins, as well as their value in *l. s. d.* which have been received or paid by bills of exchange, for goods ſold by factors or correſpondents, or bought by them for the accounts before; here you muſt firſt balance the ſaid inward column of dollars, crowns, &c.

To remove an account full written to another folio.

Sum or add up the Dr and Cr ſides, and ſee the difference, which place to its oppoſite: as admit the Cr ſide exceeds the Dr then you are to write the line in the old account to balance on the Dr ſide, to anſwer the line on the Cr ſide of the new account.

How

How to balance at the year's end and thereby to know the ſtate of your affairs and circumſtances.

YOU muſt make an account of balance on the next void leaf or folio of your Ledger to your other accounts; but after ſo done, do not venture to draw out the account of balance in the ſaid folio, till you have made it exact on a ſheet of paper, ruled and titled for that purpoſe; becauſe of miſtakes or errors that may occur or happen in the courſe of balancing your Ledger, which are to be rectified, and will cauſe eraſements or alterations in that account, which ought to be very fair and exact; and after you have made it to bear in the ſaid ſheet, copy fair the ſaid account of balance in the Ledger.

The rules for balancing are theſe, viz.

1*ſt*, Even your account of caſh, and bear the nett reſt to balance Dr.

2*dly*, Caſt up all your goods bought, and thoſe ſold of what kind ſoever, in each account of goods, and ſee whether all goods bought be ſold or not; and if any remain unſold, value them as they coſt you, or according to the preſent market-price, ready money, and bear the nett reſt to balance Dr.

3*dly*, See what your goods or wares ſeverally coſt, and alſo how much they were ſold for, and bear the nett gain or loſs to the account of Profit and Loſs.

4*thly*, Even all the perſonal accounts with your Drs. and your Crs. in order as they lie, and bear the nett reſt of them ſeverally to balance.

5*thly*, Even your voyages, your factors accounts, where in is either gain or loſs, and bear the nett gain or loſs to the account of Profit and Loſs; and the goods unſold to balance.

6*thly*, Even the account of Profit and Loſs, and bear the nett reſt to ſtock or capital, as an advance to your ſtock or capital.

7*thly*, Even your ſtock, and bear the nett reſt to balance Cr.

Then caſt up the Dr. and Cr. ſides of your balance, and if they come both alike, then are your accounts well kept; otherwiſe you muſt find out your error by pricking over your books again, to ſee whether you have entered every Dr. and Cr. in the Ledger as you ought.

Note,

Note, *By pricking over the book is meant an examining every article in the Journal, againſt the Ledger; and marking it thus* *, *or thus* †; *and upon the ſecond examination thus* ‡; *and upon a third examination thus* ‖, *or any other mark.*

Note alſo, *In all accounts of goods, you muſt keep a column in the middle of the leaf of each ſide, for number, weight, and meaſure.*

Though all that hath been ſaid in relation to Book-keeping, and the ſeveral rules thereto belonging, may ſeem a little abſtruſe to the altogether unlearned therein, yet there is no ſuch mighty difficulty to inſtruct them as they may imagine; for theſe following hints may render what hath been already ſaid intelligible to an ordinary capacity.

1ſt, Stick cloſe to the text, or general rule before mentioned, viz. That all things received, or the receiver, are debtors to all things delivered or the deliverer: for this rule holds good in all caſes.

2dly, When the Dr (whether perſon or goods) is known, the Cr is eaſily underſtood, without mentioning it: for if A be Dr to B, then B is Cr by A, for what ſum ſoever it be; alſo if goods be Dr to C, then C is Cr by thoſe goods, for the ſum they amount to. — This I mention, becauſe that moſt authors (if not all that I have met with on the ſubject of Book-keeping) ſpend a great many words, which I think (begging their pardon if I err) might be ſaved in declaring the Creditor, as well as ſhewing the Debtor, when it may be underſtood as aforeſaid.

3dly, This art of Italian Book-keeping, is called Book-keeping by Double Entry, becauſe there muſt be two entries; the firſt being a charging of a perſon, money, or goods; and the ſecond a diſcharging of a perſon, money or goods.

4thly, *Strictly note*, That if the firſt entry be on the Dr or left hand ſide of your Ledger; the next or ſecond entry muſt always be made on the right or Cr dit ſide of your Ledger; for whenever one perſon or thing is charged, then always another perſon or thing is diſcharged for the ſaid ſum, let it be what it will.

And ſo it is in balancing or evening an account, and carrying it to another folio; for, if the old account be evened by the balance on the Credit ſide, then the new account

account muſt be debited or charged on the Debit-ſide, for the ſum that balanced that old account.

Much more ought to be ſaid on this art of Book-keeping, if I had room; but I have plainly ſpoke to the principal fundamentals thereof, which I hope may be ſufficient for the inſtruction and improvement of any intelligent reader.

The next matter I ſhall go upon, is to ſhew, or give examples, of various kinds of receipts, and promiſſory notes; alſo bills of parcels in different trades; likewiſe bills of book-debts, bills of exchange, with remarks on them; and ſome other precedents of writings in trade, and mercantile affairs: and firſt,

Of RECEIPTS *of different Forms.*

	l.	*s.*	*d.*
RECEIVED, September 24, 1788, of Mr Anthony Archer, the ſum of ſix pounds nine ſhillings; I ſay, received for my maſter Brian Barry, per me	6	9	0

CALEB CATCHMONEY.

London, Sept. 23, 1788.

RECEIVED of Mr Kendrick Keep touch, ten pounds eleven ſhillings and ſix pence, in full payment, per me	10	11	6

HENRY HASTY.

Note, *The ſum received muſt always be expreſſed in words at length, and not in figures, in the body of the receipt; but it may and ought to be expreſſed in figures behind a brace, (as in the two foregoing examples) or elſe between two lines on the left hand of the name at the bottom of the receipts, (as is ſhewn in the promiſſory notes in* pages 159, 160.) *as well as in the body of the receipt.*

When a receipt is given in a book, there is no occaſion to mention the man's name of whom you receive the money, becauſe that is implied, he being the owner of the book.

A Receipt in part of Goods ſold.

	l.	*s.*	*d.*
RECEIVED, September 24, 1788, of Mr Timothy Truſtlittle, fifty pounds, in part of indigo ſold him the 22d inſtant, per me	50	0	0

LAURENCE LOVEMONEY.

A Receipt given in a Receipt-book.

RECEIVED, September 26, 1788. the ſum of forty-five pounds, by the order and for the account of George Greedy, per TIMOTHY TRUSTY. — l. 45 s. 0 d. 0

RECEIVED, September 27, 1788, of Mr Daniel Davenport and company, one hundred pounds, on account of ſelf and partner, per JAMES JENKS. — 100 0

RECEIVED, September 28, 1788, of Mr Peter Punctual, fifty-five pounds ſixteen ſhillings and nine-pence, in part of Tobacco ſold him the 24th of Auguſt laſt paſt, per FABIAN FUNK. — 55 16

RECEIVED, September 29, 1788, of the Hon. Eaſt-India Company, three hundred and fifteen pounds ten ſhillings, per order and for the account of Peter Pepper, per STEPHEN STORAX. — 315 10

RECEIVED, October 2, 1788, of the Governor and Company of the Bank of England, one thouſand ſix hundred pounds ten ſhillings, for ſelf and Company, per LEONARD LONGPURSE. — 1600 10 0

RECEIVED, October 5, 1788, of the Worſhipful Company of Grocers forty-nine pounds fifteen ſhillings, in full payment, for my father Peter Plumb, per me PETER PLUMB, junior. — 49 15

RECEIVED, November 9, 1788, of the Right Honourable Sir Samuel Fludyer, Knt. Lord Mayor of London, the ſum of ſixty pounds, for the uſe of the Worſhipful Company of Haberdaſhers, per CALEB CAREFUL, Clerk. — 60 0

A Rent

A Rent-gatherer's Receipt.

	l.	s.	d.
RECEIVED, October 14, 1788, of Mr Aaron Arable, in money, eighteen pounds, and allowed him for land-tax five pounds, and for repairs two pounds; in all twenty five pounds, in full for half a year's rent due at Michaelmas last; I say, received for the use of Laurence Letland, Esq; by virtue of his letter of attorney, per me ROBERT RENTROLL.	25	0	0
RECEIVED of Mr Timothy Tenant, this 25th day of October, 1788, six pounds, for a quarter's rent, due at Michaelmas last, for my master Launcelot Letfarm, per me FRANCIS FAITHFUL.	6	0	0
RECEIVED, August 14, 1788, of Mr Peter Bishop, twenty-nine pounds six shillings, in part of a bill of sixty pounds, due the 3d of Xber. next, to Mr Samson Shuffle, per FRANCIS FIDDLE.	29	6	0

A Receipt on the back of a Bill of Exchange.

SEPTEMBER 30, 1788, Received the full contents of the within mentioned, being 50 pieces of eight, per NATHAN. NEEDY.	50 pcs. of 8

Promissory Notes.

I Promise to pay to Mr Timothy Teazer, or order, sixty pounds, on the 20th of this instant September. Witness my hand this 15th day of September, 1788.

DANIEL DILATORY.

£60 0 0

October 18, 1788.

I Promise to pay to the Honourable the Directors of the South-Sea Company, or bearer, on demand, four hundred and fifty-pounds, for my father James Jones.

£450 WILLIAM JONES.

October 23, 1788.

I Promiſe to pay unto the Governor and Company of the Bank of England, or order, on demand, two thouſand pounds.

NAHUM NEEDNOTHING.

l. 2000

October 24, 1788.

I Promiſe to pay to Miles Man and Company, or bearer, on demand, ſeven hundred ſixty-ſix pounds ten ſhillings and nine pence, for my maſter Robert Regular.

LEWIS MARTIN.

l. 766 10 9

October 25, 1788.

I Promiſe to pay to the Honourable Eaſt-India Company, or bearer upon demand, five hundred pounds for Henry Hudſon.

MARTIN MONEYBAG.

l. 500

October 26, 1788.

I Promiſe to pay to Mr Chriſtopher Caſh, or order three months after date, five pounds, for value received. Witneſs my hand this 26th day of October, 1788.

ROBERT RUCH.

l. 5 0 0

A Note given by two.

WE, or either of us, promiſe to pay to Mr Matthew Miſtruſt, or his order, ſix pounds ſterling on demand, for value received. Witneſs our hands this 27th of September, 1788.

NATHAN NEEDY
SAMUEL SURETY.

l. 6 0 0

Witneſs Nicholas Notice.

A Bi

A Bill of Debt.

MEMORANDUM, That I William Want, of London, weaver, do owe, and am indebted unto Mr Timothy Truſt, of Weſtminſter, watchmaker, the ſum of twenty-five pounds ſix ſhillings of lawful money of Great Britain; which ſum I promiſe to pay to the ſaid Timothy Truſt, his executors, adminiſtrators, or aſſigns, on or before the 10th day of December next enſuing. Witneſs my hand this 22d day of October, 1788.

Witneſs Titus Teſtis. WILLIAM WANT.

Bills of Parcels.

IT is uſual, when goods are ſold, for the ſeller to deliver to the buyer, with the goods, a bill of parcels, which is a note of their contents and prices, with a total of their value caſt up, &c.—Theſe bills ought to be handſomely writ, and in a methodical order, according to the beſt and cuſtomary way of each particular trade.

I ſhall therefore ſhew the forms of bills of parcels in ſome trades and profeſſions, with the ſhorteſt methods of caſting up the ſeveral articles in each bill.

A Mercer's bill.

London, September 29, 1788.

Bought of Abel Atlas, and Ben. Burdett, viz.

12 yds ¾ of rich flowered ſattin, at 12*s.* 6*d.* per yd.
8 yds of ſprigged tabby, at 6*s.* 3*d.* per yd.
5 yds ¼ of farringdon, at 6*s.* 8*d.* per yd.
9 yds of mohair, at 4*s.* 2*d.* per yd.
17 yds ½ of luteſtring, at 3*s.* 4*d.* per yd.

16 7 8½

Sometimes the money is paid preſently, then the receipt is made as follows:

Received the 26th of September 1788, ſixteen pounds ſeven ſhillings and eight pence, in full of this bill, for my maſter Abel Atlas and Company, per me.

FRANCIS FAIRSPOKEN.

A Woollen-draper's bill.

London, September 24, 1788.

Bought of Benjamin Broadcloth, 22d of September, 1788.

7 yds of fine Spaniſh Black, at 18 4 per yd.
5 yds ¼ of ditto, at 12 4 ditto

6 yds $\frac{3}{4}$ of fine mixed cloth, at	15	9	per yd
16 yds $\frac{3}{4}$ of frieze, at	3	6	ditto
4 yds of drab de-berry, at	13	5	ditto
5 yds $\frac{7}{8}$ of ſuperfine Spaniſh cloth, at	18	10	ditto

A Linen-draper's bill.

September 26, 1788.

Bought of Marmaduke Muſlin, viz.

16 ells of dowlas, at 1*s*. 4*d*. per ell.
4 ells of lockram, at 1*s*. 3*d*. per ell.
22 ells $\frac{1}{4}$ of holland, at 3*s*. 4*d*. per ell.
1 piece of cambric, at 15*s*.
85 yds $\frac{1}{4}$ of diaper, at 1*s*. 10*d*. per yd.
19 yds $\frac{1}{4}$ of damaſk, at 4*s*. 3*d*. per yd.
2 pieces of muſlin, at 18*s*. 10*d*. per piece.

The ſeveral articles of theſe bills are purpoſely omitted, being caſt up for the exerciſe of the traders in the rules of practice, or in thoſe of multiplication of money, before ſhewn; which indeed is the beſt method of all, for the ready caſting up the articles contained in any bill of parcels whatſoever.

Example.

We will take the laſt article of the woolen draper's bill, viz. 5 yds. &c. $\frac{7}{8}$ at 18*s*. 10*d*. per yard.

		$5\frac{7}{8}$			18	10
						7
l.	4	14	2			
		16	$5\frac{3}{4}$	8)	131	10
Fecit l.	5	10	$7\frac{3}{4}$		16	$5\frac{3}{4}$

In this example the price is multiplied by the quantity, viz. 5 yards $\frac{7}{8}$, according to the rules delivered in multiplication of money, and the product by 5 is *l*. 4 14 2; then for the $\frac{7}{8}$ of a yard, I multiply the price of the integer, viz. 18*s*. 10*d*. by the numerator of the fraction, viz. 7, and divide by the denominator 8, and the quotient is 16*s*. $5\frac{3}{4}d$. agreeable with the rule ſpoken to in the doctrine of fractions. Which 16*s*. $5\frac{3}{4}d$. added to the product of 18*s*. 10*d*. multiplied by 5, gives *l*. 5 10 $7\frac{3}{4}$, as in the operation above.

A Gi-

A Grocer's Bill.

Bought of Robert Raiſin and Peter Plumb, October 4, 1788, viz.

	C.	qrs.	lb.		l.	s.	d.	
Sugar 2 hhds. qt.	17	2	17	at	1	10	6	per C.
Raiſins 3 barrels	6	1	19	at	1	14	5	
Tobacco 1 hhd.	4	0	12	at	4	19	4	
Rice 1 barrel	1	0	15	at	2	16	4	
Pepper 1 bag	1	3	19	at	3	12	4	
Brimſtone	2	1	19	at	1	19	1	

A Hoſier's Bill.

Bought of Sylveſter Slipſtocking, October 5, 1788, viz.

5 pair of women's mixed worſted hoſe, at	5s.	7d.	
3 pair of women's ſilk hoſe, at -		9	4
22 pair of men's woollen ditto, at -		3	2
8 pair of women's ditto at -		2	2
21 yards of flannel, at - -		1	11
6 pair of thread hoſe, at - -		3	4

A Fiſh-monger's Bill.

Bought of Leonard Ling, October 6, 1788.

3 C. of haberdine, at -	l.	7	18	6 per C.
1 C. ½ of ling, at -		8	12	6
1 C. ¼ of ſtock-fiſh, at -		4	10	6
6 barrels ½ of white herrings, at		3	10	2
1 barrel of red herrings, at -		2	12	6
95 dried ſalmon, at -		0	10	2

Note, Of haberdine or ling, 124 is a hundred; of ſtock-fiſh and herrings, 120 to the hundred, 1200 to a thouſand, and 12 barrels to a laſt.

A Leatherſellers Bill.

Bought of Henry Hide, October 17, 1788, viz.

	s.	d.	
15 large oiled lamb-ſkins, at	1	3½	per ſkin.
13 kipp of goat ſkins, at -	3	4	
137 alumed ſheep-ſkins, at -	1	3	
19 calves ſkins, at -	4	3	
85 oiled buck ſkins, at -	12	9	
10 Ruſſia hides, at -	12	9	
60 dicker of hides, at	l. 15	11	6

Note, 50 goat-ſkins make a kipp; and other ſkins are five-ſcore to the hundred. A dicker is 10 hides or ſkins and 20 dickers a laſt.

A Pew-

A Pewterer's Bill.

Bought of Andrew Antimony, October 7, 1788, viz.

	l.	s.	d.
9 hard metal diſhes, wt. 42 lb. at 14*d.* per lb.	2	9	0
1 dozen of ditto plates - -	0	17	0
1 chamber-pot of ditto - -	0	4	0
1 ſtandiſh of ditto - - -	0	4	0
2 tankards of ditto - - -	0	5	10
18 beſt ſpoons - - -	0	4	6
3 hard metal porringers - -	0	3	0
1 ſalt of ditto - - -	0	1	10
1 ſet of caſtors - - -	0	10	0
	4	19	2

Bill on Book-debts.

A Woollen draper's Bill.

Mr Francis Frieze, Dr.

1788.		s.	d.	
April 20.	To 16¼ yards of black cloth, at - -	18	3	per yd.
May 4.	To 4⅛ yds of drap-de berry, at - -	15	6	
24.	To 35 yds of mixed gray cloth, at - -	10	5	
17.	To 9 yds of fine ditto, at	17	3	
June 12.	To 12¾ yards of fine broad cloth, at - -	17	3	

If the gentleman pays the whole bill, then make the receipt, thus:

Received the 19th of October 1788, of Mr Francis Frieze, the ſum of fifty-four pounds, &c. in full of this bill, and of all accounts, for my maſter David Draper, l. 54. &c.

per MICHAEL MEASUREWELL.

A Mercer's Bill.

1788. Madame Dinah Dilatory Dr to Bryan Brocade, viz.

	Yds.	s.	d.	
March 6.	To 16½ of flowered ſattin, at	14	9	per yd.
April 14.	To 14 of Venetian ſilk, at	11	8	
Ditto 16.	To 99 of mohair, at -	6	3	
May 16.	To 14½ of flowered damaſk, at	9	7	
June 7.	To 5⅛ of Genoa velvet, at	21	6	
Ditto 25.	To ¾ of Luteſtring, at -	4	7	

If part of the bill is paid, write thus:

Received of Madame Dinah Dilatory, twelve pounds ten ſhillings, in part of payment, for my maſter Bryan Brocade. } l. s. d. 12 10 0

per HENRY HUNTER.

A Corn-Chandler's Bill.

1788.	Mr Robert Racer Dr. to Lionel Livery.	s.	d.	
April 24.	To 5 quarters of oats, at	2	3	per buſh.
May 16.	To 9 buſhels of beans at	4	10	
June 19.	To 7 buſhels of bran, at	1	10	
	To 19 buſhels of oats, at	1	11	
Ditto 25.	To 16 buſhels of beans, at	3	11	

A Tobacconiſt's Bill.

1788.	Mr Fume Dr. to Rich. Raiſecloud, viz.		
May 1.	To 1 hhd. of tobacco qt. nett. 569 lb. at - -	d. 10½	per lb.
Ditto 25.	To 1 box qt. 75½lb. nett, at	11¼	
June 4.	To 5 bags of old Spaniſh, qt. nett, 671 lb. at -	3⅞	
July 12.	To ½ hhd. qt. 334 groſs, tare 42, nett 293 lb. at -	5¼	
Sept. 7.	To 2 rolls of tobacco, qt. 94lb. at	9½	

A Stationer's Bill

1788.	Mr Siſerah Scribler Dr. to Phineas Foolſcap, viz. Reams.	s.	d.	
July 1.	To 57 of demy paper, at	10	9	per R.
Ditto 21.	To 195 of 2d foolſcap, at	6	3	
Aug. 24.	To 375 of 2d demy, at -	8	2	
Sept. 6.	To 95 French Royal, at -	12	6	
Oct. 26.	To 29 rolls of parchment, at	15	11	

Note, A roll of parchment is 60 ſkins: a ream of paper 20 quires; and a bale of paper 10 reams.

A Bricklayer's Bill

1788.	Mr Martin Meſſuage Dr. to Peter Pantiles. viz.	
March 27.	To 25 thouſand bricks, at 16s. per M.	
Ditto 30.	To 11 thouſand plain tiles, at 20s. 6d. per M.	
April 1.	To 28 C. of lime, at 12s. per C.	

April

April 9.	To 20 loads of ſand, at 3s. 6d. per load.
May 20.	To 140 ridge-tiles, at 8s. 6d. per C.
June 24.	To 90 days work myſelf, at 3s. per day.
	To 90 days my man, at 2s. 6d.
	To 90 days another bricklayer, as 2s. 6d.
	To 90 days for 2 labourers, at 20d. a day each.

Note, 1000 *plain tiles is* 1 *load*; *and* 25 *bags or buſhels of lime is* 1 C. *A brick muſt be* 9 *inches long, and* 4½ *inches broad. Bricks are of three ſorts*, plaice bricks, red and grey ſtock bricks.

Here it will be convenient to give a general rule for the caſting up any thing ſold by the thouſand, as bricks, tiles, clinkards, or Flanders paving bricks, and ſeveral other things mentioned in the book of Rates, viz. barrel-hoops, gooſe-quills, oranges and lemons, ſquirrel-ſkins, billets, &c.

And the eaſy Rule is this, viz.

Multiply the given number by the ſhillings in the price, (if the price be at ſo many ſhillings per M.) and always cut off three figures or places towards the right hand; and the figures towards the left hand are ſhillings, which divide by 20, to bring them into pounds; and thoſe figures ſeparated towards the right hand, multiply by 12, the next inferior denomination; and ſtill cut off, or ſeparate three places towards the right hand, and the figures towards the left are pence; and the three laſt figures cut off, multiply by 4; and ſtill ſeparate three places towards the right hand, and the figures towards the left are farthings. And if the price be ſhillings and pence, or ſhillings, pence, and farthings per thouſand, then multiply by the ſhillings as before, and take the parts for pence and farthings, as in the Rule of Practice; add theſe together, and proceed as above directed.

Example

Example 1.

2465
17
172550
24650
4191050 *Anſ.* 419s. 0½d. or 20l. 19s. 0½d.
12
01600
4
21400

Example 2.

6d.—½ 261324 plain tiles, at 20s. 6d. per thouſand.
16
1567944
261324 *Anſ.* 4311s. 10d. $\frac{608}{1000}$f.
130662 or 215l. 11s. 10d.
43111846
12
101152
4
608

When things are ſold by the hundred, as Dutch and Engliſh pantiles, then follow this rule, viz.

Multiply the given quantity by the ſhillings in the price, and take parts for the pence and farthings (if any) as before; then from the right hand of the ſum cut off two places, and proceed as in the laſt rule.

Example 1.

1726 pantiles, at 7s. per C.

7
120182
12
9184
4
3136

Anſ. 120s. 9d. ½, or 6l. 0s. 9d. ½ and $\frac{16}{100}$ of a farthing.

Example

Example 2.

6d.—½ 2964 ſtock bricks, at 2s. 6d. per C.
2

5928 *Anſ.* 74s. 1d. $\frac{80}{100}$f. or 3l. 14s. 1d.
1482

74|10
12

1|20
4

80

Of Bills of Exchange.

BILLS of Exchange are either inland or foreign; the inland bills are drawn by one trader in one city or town, upon another of another city or town in the ſame kingdom; as London upon Briſtol, or Exeter upon London, &c and theſe chiefly concern our ſhop-keepers, and wholeſale traders either of town or country; and the foreign more immediately concern the merchant:

Bills of Exchange, if handſomely drawn, muſt be written in a fair hand, on a long piece of paper, about three inches broad, and writ in form after the following precedents:

A Bill payable at Sight.

London, 5th October, 1788.

AT ſight hereof, pay to Mr Gregory Greedy, or his order, the ſum of fifty pounds, for value received of Chriſtopher Caſh; and place it to account, as per advice from

To Mr Peter Punctual,
Grocer in High-Street,
Briſtol.

Your humble ſervant,
DANIEL DRAWBILL.

Note, A bill at ſight is payable three days after the acceptor ſeeth it.

Exon. November 14, 1788.

SEVEN days after ſight hereof, pay to Mr Nathan Needy, or his order, twenty-four pounds ten ſhillings, for the value received here of Mr Timoth

Tranſer

Transfer, and place it to account, as per advice from

To Mr Simeon Certain,
Haberdaſher in Milk-ſtreet, London.

Your friend and ſervant,
MICHAEL MONEYMAN.

If Mr Needy ſends his ſervant, Andrew Benſon, to receive the money; after he hath writ his name on the back of the bill, (which is his order) the ſervant muſt write a receipt to his maſter's name, thus:

REceived, November 16, 1788, *the full contents of the within-mentioned bill, being twenty-four pounds ten ſhillings.*

Witneſs
Andrew Benſon.

NATHAN NEEDY.

A Foreign Bill of Exchange.

London, October 6, 1788, *for* 460 crowns, at 56d. ½ ſterling per crown.

AT uſance pay this my firſt bill of Exchange (my ſecond or third not being paid) unto Mr Henry Vernon, or order, four hundred and ſixty crowns, at 56d. ½ per crown, for the value received of Mr Samuel Thompſon, and paſs it to account, as per advice from,

Sir,

To Mr Will. Walker, merchant at Paris.

Your humble ſervant,
EBENEZER REYNOLDS.

Another.

London, 17th *October,* 1788, for 480 dollars, at 55d. ½ per dollar.

AT three uſance pay this my firſt bill of exchange, unto Mr William Wealthy, or order, four hundred and eighty dollars, at 55d. ½ ſterling per dollar, for the value received of himſelf, and place it to account, as per advice from

To Meſſ. Daniel and David Bernardiſton, merchants in Aleppo.

Your humble ſervant,
MARK MERCATOR.

Note, *Uſance* between England and France, or Holland, is one kalendar month; between England and Spain

Spain, or Portugal, two months; between England and Italy, three months, &c.

Once more.

Briſtol, 8th *October*, 1788, for 600 pieces of eight, at 53d. ⅛ per piece.

AT double uſance pay this my firſt Bill of Exchange unto Mr Laurence de Luz, or his order, ſix hundred pieces of eight Mexico, at fifty-three pence ⅛ ſterling per piece of eight, for value received of Gomez Henriques, and paſs it to account, as per advice from

Yours,

To Mr Simon Surepay, merchant in Leghorn. WILLIAM HENRY HERR

Notes on Bills of Exchange.

1 THE acceptor of any bill is become abſolute debtor to the perſon to whom the bill is payable, for the contents thereof.

2 The perſon to whom the bill is payable, muſt demand the money the very day it becomes due; and if the acceptor die before it becomes due, it muſt be demanded of the executor or adminiſtrator.

3. The drawer of any bill muſt always give his correſpondent a letter of advice, that he hath drawn ſuch a bill on him for ſuch a ſum, &c.

4 None may pay a bill without ſuch a letter of advice.

5. In England a bill is due the third day after the expiration of the time mentioned in the bill.

Of Indorſing.

IT frequently happens, that between the acceptance of a bill, and the time of payment the party to whom it is firſt made payable hath occaſion to pay it away; if ſo he writes his name on the back of the bill, which is his order, (as ſaid before) and gives it to the perſon he is indebted to, and then he is impowered to receive the money; and it may be, the ſecond perſon alſo wants to pay it away, and then he writes his name likewiſe under the other, and delivers it to a third perſon to receive the money; and it may be the third does the ſame, and delivers it to a fourth perſon, &c. All that do ſo are in-

dorſers

orſers; and he that laſt hath the bill, if the acceptor ill not pay it, may ſue him, or the indorſers, or drawer, r any of them, for the money.

An indorſement is generally in theſe words, viz. *Pay he contents of the within-mentioned bill to Henry Haſty.*

GEORGE GREEDY.

But generally the name only is accounted ſufficient.

Of Proteſting.

WHEN a bill is to be proteſted, the party that hath the bill muſt go to a public notary, (not common ſcriviner) whoſe buſineſs it is: and he goes ith you to the acceptor's houſe, and demands payment, c. And then he draws up a proteſt according to law; hich is to be returned to the drawer within the time mited, &c.

It is needleſs to give here the form of a proteſt, beauſe no man can do it himſelf.

A Bill of Debt.

KNOW all men by theſe preſents, that I, Laurence Lackcaſh, of Southwark, vintner, do owe, and am debted unto Charles Creditman, of the ſame place, lter, the ſum of one hundred and fifty pounds of lawul money of Great Britain; which ſaid ſum I promiſe pay unto the ſaid Charles Creditman, his executors, dminiſtrators, or aſſigns, on or before the 24th of December next enſuing the date hereof. Witneſs my and and ſeal this ſixth day of April, 1788.

ealed and delivered
in the preſence of LAURENCE LACKCASH.

A Bill for Money borrowed.

RECEIVED and borrowed of Oliver Overcaſh, of London, merchant, fifty pounds, which I do here promiſe to pay on demand. Witneſs my hand this th day of, April 1788.

PETER PENURY.

£. 50

The Charge of Noting and Proteſting a Bill.

		s. d.			s. d.
Noting,	within the city,	1 6	Proteſting	within	3 0
	without the city,	2 6		without	5 0

The Form of a Bill of Lading.

SHIPPED, by the grace of God, in good order, and well conditioned, by Edward Export, of London, merchant, in and upon the good ſhip called (the *Bilboa merchant of London*) whereof is maſter, under God for this preſent voyage, (Martin Mizen, of London, mariner) and now riding at anchor in (the port of London) and by God's grace, bound for (Cadiz) to ſay (1 bale of ſtocking-baize, TD and 1 trunk, containing five hundred pair of ſilk No. ſtockings, contents, &c. as per invoice) being mark-1,2. ed and numbered as *per* margin, and are to be delivered in the like good order at the aforeſaid port of (Cadiz) the danger of the ſeas only excepted, unto (Mr Thomas Drake, merchant there) or to his aſſigns, he or they paying freight for the ſaid goods (three pieces of eight per cwt.) with primage and average accuſtomed. In witneſs whereof, the maſter, or purſer, of the ſaid ſhip hath affirmed to (three) bills of lading, all of this tenor and date, one of which (three) bills being accomplished, the other (two) to ſtand void. And ſo God ſend the ſaid good ſhip to her deſired port in ſafety. *Amen.*

Dated in London, the 8th of April, 1788, inſides and contents unknown to MARTIN MIZEN

Note, *The ſeveral words included in the parentheſes are to be put in to the ſeveral vacant places that are in a blank bill of lading.*

Note alſo, *Average is the general allowance made to the maſter of the ſhip, of* 1d. *or* 2d. *in every ſhilling freight, primage, a ſmall allowance to be diſtributed among the ſailors.*

The Form of an Invoice.

Port-Royal in Jamaica, April 24, *anno* 178

INVOICE of five barrels of indico, five hhds. of ſugar and five hhds. of pimento, ſhipped on board the George of London, George Jones commander, for ac cou

count and risk of Messr. John and Thomas Fisher, of London, merchants, being marked and numbered, as per margin; contents, costs, and charges, as in the following example:

viz.	Indico 5 B.						l.	s.	d.
IF	143 lb.								
No.	143								
121	146								
to	152								
125	172								
	756 lb. nett, at 2s. 2d. per lb.						81	18	—
	Sugar								
	5 hhds.		Tare						
No.	C. qr. lb.		C. qr. lb.			C. qr. lb.			
126	11 3 27		1 2 19		Gross	68 0 0			
to	12 2 19		1 3 0		Tare	8 3 12			
130	13 2 13		1 2 16						
	14 1 15		1 3 11		Nett	59 0 16			
	15 1 10		1 3 22		at 24s. per C.		70	19	5
	68 0 0		8 3 12						
	Pimento.		lb.						
No.	5 hhds. tare.		2026 gross.						
131	lb.	lb.	389 tare.						
to	432	84							
135	396	72	Nett 1637 at 11½d. per lb.				78	—	9½
	410	81							
	376	70	Charges.						
	412	82	To cost of 5 barrels and 10						
			hhds.	-		4 7 9			
	2026	389	To storage,	-		1 0 0	5	7	9
							236	15	11½
			To commission at 5 per C.				11	16	8½
			Errors excepted, per *A. B.*						

An Account of Sales.

Port-Royal in Jamaica, July 24, 1788.

ACCOUNT of sale of 2765 ells of brown Osnaburghs, 1112 yards of blue Hartford, 2 pieces of grey cloth, qt. 39 yards, 50 pair of fine worsted hose,

and 175 ells of bag Holland, received from on board the ſhip Good Succeſs, Captain Samuel Sharp commander, for account of Laurence Lucky of London, merchant, is Dr.

		l.	s.	d.
To portage of ditto	l. 0 17 6			
To commiſſion of ſales	13 1 11			
To ſtorage, at ½ per cent.	6 10 11½			
		20	10	4½
To the nett product carried to the credit of your account, bad debts excepted,		241	6	4½
		261	16	9

Per contra Cr.

By 2765 brown Oſnaburghs, making 3456¼ yds. at 8½d. per yard, ſold Ambique Baker.	122	8	2
By 1112 yds. of blue linen, ſold at 7¾ per yd.	35	18	2
By James Smart, for 39 yds. of cloth, at 15s. per yard,	29	5	0
By Laurence Monk, for 50 pair of hoſe, at 7s. 10d. per pair,	19	11	8
By ditto, for 175 ells of bag Holland, at 6s. 3d. per ell,	54	13	9
	261	16	9

Errors excepted, July 24, 1788, per
CHARLES CAREFUL.

Buſineſs at the Water-ſide, concerning Exporting and Importing of Goods, &c. entering them at the Cuſtom-houſe, &c.

WHEN there are goods to export, and ready packed, &c. there muſt firſt be made a bill of entry (as it is called) of the contents, after this form, viz.

In the Loyal Merchant, William Worm, for Barbadoes
EDWIN EXPORT

Three caſes of haberdaſhery.
Five tuns of beer, &c.

Of theſe bills there muſt be ſeven, one of which must be in words at length, and the other may be expreſſed in figures. Theſe are, by the clerks of the cuſtom-houſe entered into ſeveral books for that purpoſe.—If ſome goods pay cuſtom, and others not, then there muſt

be made two entries, one for thoſe that pay cuſtom, and another for thoſe that pay not; and likewiſe you muſt have two cockets.

A *cocket* teſtifies the payment of all duties, and is writ on a ſmall piece of parchment, in the following words:

"Know ye, that Edwin Export, merchant, for three "caſes of haberdaſhery, and five tuns of beer in the "Loyal Merchant, William Worm, for Barbadoes, "hath paid all duties. Dated 9th November, 1788."

On the back ſide of the cocket you muſt ſet down the marks, numbers, and quantity of the goods expreſſed in the inſide. When on clean paper you tranſcribe your bill of entry upon which a ſhipping bill will be made out, on the back of which ſignify the marks, numbers, and contents, as before on the cocket; both which being thus indorſed, you are to deliver them to the ſearcher, at the water-ſide, who depoſits them in the office till the going away of the ſhip, and then they are delivered to the captain or maſter of the ſhip.

If you have not judgment or experience enough to enter your goods yourſelf, it is but applying yourſelf to any one of the clerks in the long-room, who make it their buſineſs (and good buſineſs too) to enter people's goods; and for a ſhilling (you giving them the contents) they will write your bills, and paſs your entries, without giving you any further trouble, or your running any riſk of making any falſe entries, &c.

Entry Inwards.

THE ſhip being arrived, ſearch the entry-book in the long-room, and you will find the name of the ſhip and captain, and alſo the waiters that are to attend the delivery of the ſhip, and at what key the goods will be landed. The entry inwards runs thus:

In the Mercury, John Keelhaul, from Antigua.

25 hhds. of ſugar, &c.

50 bags of cotton, &c.

There muſt be eight of theſe bills (though but ſeven outwards), and one of theſe muſt be in words at length (as well as one of the ſeven bills outwards), which is for the warrant of delivery; and muſt be ſigned by the perſon in whoſe name the goods are entered, and the mark alſo in the margin; which being done, and the fee-

for

for entry and cuſtom paid, you will then have from the land-waiters a warrant for the landing and receiving your goods.

When goods are to be exported by certificate, viz. foreign goods formerly imported; theſe goods being to be ſent abroad, or exported to another place or country by a native of England within twelve, or a ſtranger within nine months after importation, entitles, the exporter to a draw-back of part of the cuſtom paid at the importation of the ſaid goods (producing a certificate from the comptroller that they have paid the duties inwards). And the debenture of cuſtom draw-back runs thus:

Debenture.

"Chriſtopher Commerce, natural born, did, on, &c. "make an entry with us of two thouſand ells of broad "Germany linen in the Amazon, Capt. Stephen Stout, "for Jamaica, the ſubſidy, &c. was paid inwards by, &c. "as appears per certificate of the collector inwards; and "for farther manifeſtation of his juſt dealing therein, he "hath alſo taken oath before us of the ſame.

"Cuſtom-houſe, London, 9th November, 1788."

The Oath.

"*Jurat C. C.* That two thouſand ells of broad Ger- "many linen above-mentioned was really ſhipped out "and hath not been re-landed in any port or creek in "England or Wales, ſince laſt ſhipped, Nov. 9, 1788."

The Certificate-cocket.

"London: Know ye, that *C. C.* for two thouſand ells "of broad Germany linen, paid per, &c. the day, &c. "laſt, late unloaden, and now in the Amazon, Stephen "Stout, for Jamaica. Dated the 9th of November "1788."

This certificate-cocket is gained by applying to the books of the importer, to know the day, &c. when the cuſtom inward was paid, and by whom: which carry to the long-room in the cuſtom-houſe, and deliver it to the comptroller's clerk of the ſubſidy inward and outward with an account of what you would export, &c.

A little before was mentioned at what key the goods ſhould be landed, and therefore here it is proper to name the keys (or rather quays) and wharfs that goods are uſually landed at, which are theſe, viz.

Somer

Somer's key, Smart's key, Wiggen's key, Bear key, Dice key, Cuſtom-houſe key, Potter's key, Wool key, Galley key Brewer's key Ralph's key, Cheſter's key, Lyon's key, Cox's key, Hammond's, Young's, and Gaunt's keys. And the wharfs are, Freſh wharf, and Botolph wharf.

Beſides theſe, there are certain places called *docks*, which are harbours cut into the land, where there is no current, but only a flow and an ebb, occaſioned by the riſe and fall of the tide in the river Thames; and theſe are convenient for the laying of veſſels, hoys, lighters, barges, and boats, and are theſe, viz.

Billingſgate dock, Sabb's dock, Tower dock, St. Catharine's dock, Wapping dock, Hermitage dock, Execution dock and Limehouſe dock.—And above Bridge, Queenhithe dock, Puddle dock, Whitefriars dock, and Scotland-yard dock.—And on Southwark, or Surry ſide, are Saviour's dock, Clink dock, and Savery's dock, below the Bridge-yard, and ſeveral others for private uſes. But more particularly eminent on that ſide of the water is the Bridge-yard, for landing ſundry ſorts of merchandiſes, but chiefly from the ports of England.

Of Wharfage and Lighterage.

WHarfingers have ſeveral managers over them, and alſo a committee to redreſs grievances, &c. and clerks of the ſtations, with lighter-managers, and have the letting of many warehouſes (which are now very fine and commodious, being rebuilt ſince the ſad fire in Thames-ſtreet) cellars, &c. and have the privilege of keeping lighters for the carriage of goods to and from ſhips.

The Rates of Wharfage

Are generally computed at 12*d.* per ton, whether outward or inward; excepting ſugars from the Weſt Indies, which pay 2*s.* per ton, 4 hogſheads being accounted a ton (though they weigh more); cranage is included in the 12*d.* per ton wharfage; and for lighterage the wharfingers have 12*d.* for 4 hogſheads of ſugar that come from the Weſt Indies; and for wine and other goods, the lighterage is half as much as the wharfage.

Huſbands of Ships.

WHERE ſeveral perſons are concerned in a ſhip, there is uſually a huſband choſen by them, to take

take an account of every merchant's goods, &c. and pa wharfage, lighterage, porterage, &c. and theſe huſband are to collect every merchant's proportion, when they d the owner's freight.

Of Menſuration of Planes and Solids.

THE ſeveral kinds of meaſuring are three, viz.

1. *Lineal* by ſome called *running meaſure*, and is taken by a li e, which reſpects length without breadth; the parts of which are,

12 inches 1 foot, 3 feet 1 yard, 16 feet and an half 1 rod, pole, or perch.

All kinds of ornamental work, ſuch as cornice, freeze, &c. are meaſured by running meaſure.

2. *Superficial*, or ſquare meaſure, is that which reſpects length and breadth; and the parts are,

144 inches one foot, 72 inches half a foot, 36 inches one quarter of a foot, 18 inches half a quarter of a foot, 272 feet and a quarter one rod, 136 feet half a rod, 1296 inches, or 9 feet, one ſuperficial or ſquare yard.

3. *Solid*, or cube meaſure, which reſpects length, breadth, and depth or thickneſs; and the parts are,

1728 inches one foot, 1296 inches three quarters of a foot, 864 inches half a foot, 432 inches 1 quarter of a foot, and 27 feet one ſolid yard.

Superficial Meaſure.

TO meaſure things that have length and breadth, ſuch as boards, glaſs, pavement, wainſcot, and land, is to take the dimenſions of the length and breadth, according to the cuſtomary method uſed in each particular; for inſtance, board and glaſs are meaſured by the foot, the dimenſions are taken in feet and inches, and the content given in feet.

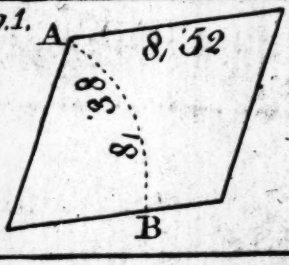
The dimenſions of wainſcoting, and paving, plaiſtering, and painting, are taken in feet and inches, and the content given in yards.

Of the ſquare and ſuperficial content or area.

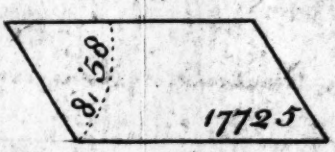
The ſquaring of any number is multiplying it into itſelf, as 12 inches multiplied by 12 inches make 144 ſquare inches. The ſuperficial content or area of any thing is found four ſeveral ways, viz. by whole numbers, by decimals, by practice, and by croſs multiplication; in

Place this at the begining of Measuring.

Fig. 1.

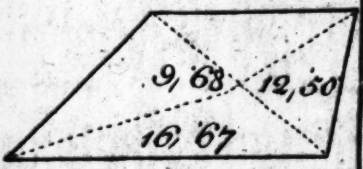


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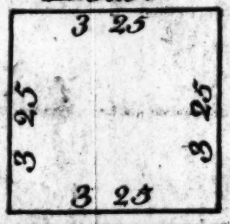


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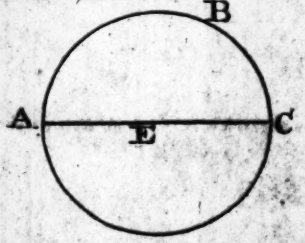


6 *A Cube*

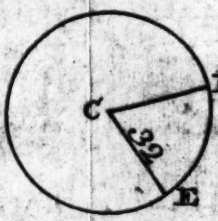


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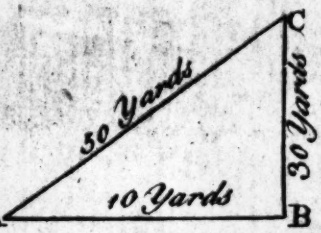


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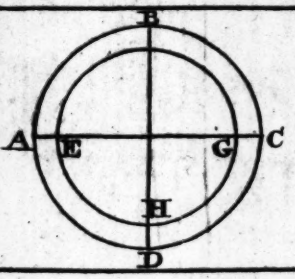


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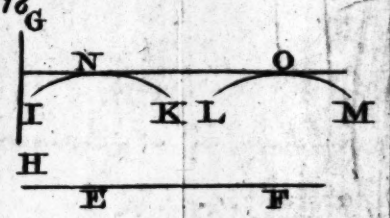


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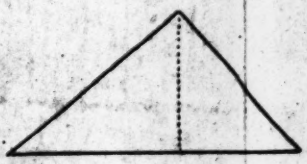


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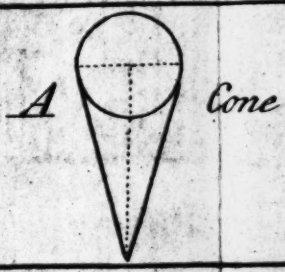
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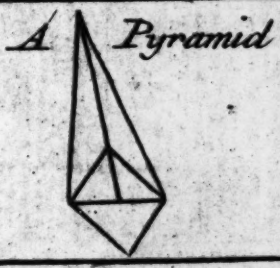
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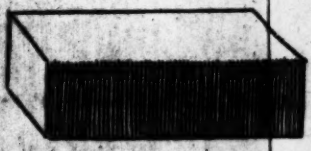
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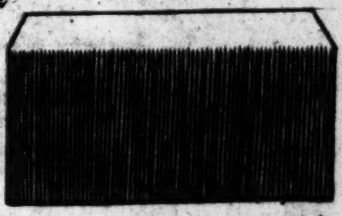
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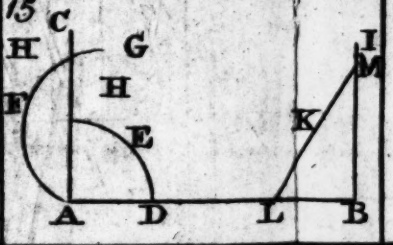
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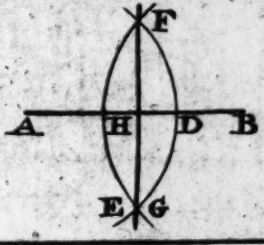
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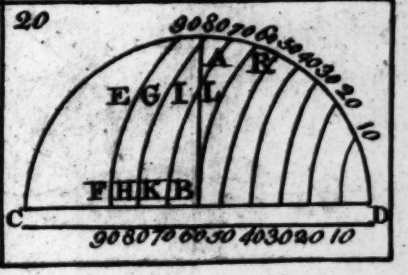
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in each of which methods I ſhall give examples of the operation.

A ſquare hath its ſides perpendicular and equal.

An oblong hath its ſides perpendicular, and thoſe that are oppoſite equal; but the adjacent ſides are unequal; boards, wainſcots, ceilings, windows, doors, &c. are commonly of this figure.

When any thing is to be meaſured, it muſt be conſidered what form or faſhion it is of, and then it muſt be meaſured according to the ſeveral rules for each figure.

1. If it be a ſquare or oblong, then the length and breadth muſt be multiplied one by the other, which gives the content in ſquare meaſure, and that product muſt be divided by its proper diviſor, according to the name in which the content or area is to be given.

Example.

Admit a board be 12 inches broad, and 8 feet, or 96 inches long, how many ſquare or ſuperficial feet doth it contain?

B. 12 | L. 96 |

96
12
144) 1152 (8 feet.
1152
(0)

Here the length in inches is multiplied by the breadth in inches, and the product 1152 divided by 144, the ſquare inches in a foot, quotes 8 feet ſquare for the content of the board.

A Rule for diſpatch.

If the length of a board or piece of glaſs be given in feet, and the breadth in inches, multiply the one by the other (without any reduction) and divide the product by 12, and the quotient will be the anſwer in feet, and the remainder will be parts of a foot; ſo the foregoing example might have been done ſooner by dividing 96 the length by 12 the breadth, and it quotes 8 feet for the content, as by the former way.

Example.

Suppoſe a board be 14 feet long, and 15 inches broad, what is the content in ſquare feet?

14 feet

14 feet long.
15 inches broad.

12)210

Feet 17 6/12 or 1/2

So the answer is 17 fe
and 1/4, and so for any oth
example of this kind.

Or conciser thus:

14
by 1—3

14
3 1/2 inch. 3/4 or 1/2

Anſ. 17 1/2

Here 3 inches is the 1/4 of
foot; wherefore 1/4 of 14
taken, and added to 14, and
makes 17 feet, and 1/2 equalto

Another Example worked four different ways.

If a board be 12 1/2 feet, or 150 inches long, and
inches broad, how may ſquare feet doth it contain?

VULGARLY.

Inches.
150 long.
15 broad.

750
150

144) 2250 (15 feet
144

810
720

Rem. 90
Multiply by 12 inches 1 foot.

144) 1080 (7 inches.
1008

Rem. 72
Multiply by 4 the quarters in an inch.

144) 288 (2 quarters or 1/2.

DECIMALLY.

12,5
1,25

625
250
125

Feet 15,625
12

Inches 7,500
4

Quarters 2,000

By croſs multiplication.

Feet.	Inches.
12	6
1	3
12	0
0	6
3	0
0	1½
Anſ. 15	7½

By practice.

Feet.	Inches.
12	6
	1 3
12	6
3 inches ¼	3 2 ½
15	7½

The four methods here uſed are as follows; firſt, by multiplying the inches together, and dividing by 144, &c. The ſecond work is performed decimally; the third method is by croſs multiplication; and the laſt and beſt is by practice.

Any of theſe methods may be eaſily underſtood by the uſe of the arithmetical part of this book, except the method by croſs multiplication, which I ſhall explain here.

In the example, 1 foot 3 ſtands under 12 feet 6; and having drawn a line, ſay, once 1 is 1; then I ſay croſs-way, 6 times 1 is 6 inches; ſo that line is 0 feet 6 inches; then croſs-way again, I ſay, 3 times 12 is 36 inches, the 12's in 36 3 times, or three feet; ſo that line is 3 feet 0 inches. Laſtly, I multiply the inches together, ſaying, 3 times 6 is 18, the 12's in 18 once, and there remains 6, or $\frac{6}{12}$, equal to $\frac{1}{2}$ as in the work.

If a board be wider at one end than the other, then take the breadth in the middle, or add the meaſure of both ends together, and take the half for the mean breadth, which multiply by the length.

Example.

Suppoſe a board to be 120 inches, and the narroweſt end 10 inches wide, the broadeſt end 34 inches wide, what is its contents in ſuperficial feet?

Add { 34 broadeſt end.
10 narroweſt.

Sum 44
Its half —
is 22 the medium.
120

144)2460 (18 feet $\frac{1}{3}$ *Anſ.*
144
1200
1152

Rem. 48 | 4 | 1
144 | 12 | 3 } or 4 inches; that is, 48, the remainder, is $\frac{1}{3}$ of 144.

Or thus:

	Feet	*Inches*	
	10	0	the length.
	1	10	the mean breadth.
	In.	10	0
For 10 in.	$6\frac{1}{2}$	5	0
	4	3	4
		18	4 *Anſ.*

If a board or piece of glaſs be ever ſo irregular, it may be meaſured very near, by taking the breadth in five or ſix places, and add the ſeveral breadths together, dividing the total by the number of places, and the quotient will be the mean breadth, which multiply by the length, &c.

Having the breadth in inches of any board or piece of glaſs, to know how much in length of that board or piece of glaſs will make a foot ſuperficial.

Rule.

Divide 144 by the inches in breadth, and the quotient will be the length of that board that will make a foot.

Example. If a board be 9 inches broad, what length of that board will make a ſuperficial foot?

9) 144

Anſ. 16

Proper

Proper Directions for Joiners, Painters, Glaſiers, &c.

Rooms being various in their forms, take this general rule in all caſes, viz.

Take a line, and apply one end of it to any corner of the room; then meaſure the room, going into every corner with the line, till you come to the place where you firſt began: then ſee how many feet and inches the ſtring contains, and ſet it down for the compaſs or round; then take the height by the ſame method.

Glaſiers are to take the depth and breadth of their work, and multiply one by the other, dividing by 144. glaſs being meaſured as a board.

Having thus ſhewn the methods of caſting up dimenſions, I come now to particulars, and the firſt of

Glaſier's Work, by the Foot.

If the windows be ſquare, multiply the length by the breadth, which will produce the content, as above ſaid.

Example.

By croſs multiplication.

Feet.	*In.*	
8	9	high
7	3	broad
56	0	
2	0	
5	3	
	2¼	3 inches ¼
63	5¼	

By practice.

Feet.	*In.*	
8	9	
	7	feet 3
61	3	
2	2¼	
63	5¼	*Anſ.*

If the windows are arched, or have a curved form, no allowance is made, by reaſon of the extraordinary trouble, and waſte of time, expence or waſte of glaſs, &c. and the dimenſions taken from the higheſt part of the arch, down to the bottom of the window, from the height or length; which multiply by the breadth, and the product will be the anſwer in feet, &c.

Glaſiers are often ſo very nice, as to take their dimenſions and meaſure to a quarter of an inch.

Example.

	Feet.	*Inches.*	
	4	$3\frac{3}{4}$	long.
	2	$7\frac{1}{4}$	broad.
	8	7	
6 inches is $\frac{1}{2}$	2	$1\frac{3}{4}$	
$1\frac{2}{4}$ is $\frac{2}{4}$		$6\frac{1}{4}$	$\frac{3}{4}$
$\frac{1}{4}$ is $\frac{1}{8}$		1	$\frac{1}{4}$
	11	$4\frac{1}{4}$	

Glaſs is meaſured by the foot, as ſaid before, and the price of work is as follows, viz.

	s.
Engliſh glaſs per foot;	0
French and crown glaſs,	1
Common work, leading included, for every foot ſquare,	0
New leading old glaſs per foot,	0
Common diamond ſquares, each	0

Painter's Work, by the Yard.

When the wainſcot of a room is painted, you are to meaſure round the room with a line, as hinted before, and the height to be taken by girting a ſtring over all the mouldings from the top of the cornice to the floor; then multiply the compaſs by the height, and you have the content in feet and inches, which may be reduced into ſquare yards by dividing by 9.

Example 1.

A room painted.

	Feet.	*In.*		
being	45	8	in compaſs,	what is the content in
	10	6	high,	ſquare yards?
	456	8		
	22	10		
9)	479	6		
Yds.	53	2	6	*Anſ.*

Exam

Example 2.

If the height of a room painted be 12 feet 4, and the compaſs 84 feet 11, what ſquare yards doth it contain?

Anſ. 116 yards 3 feet $3\frac{3}{7}$ inches.

Feet.	*In.*	
84	11	compaſs,
12	4	high.
In. 1019	0	
$4\frac{1}{7}$ 28	$3\frac{3}{7}$	
9) 1047	$3\frac{3}{7}$	
Yds 116	3 $3\frac{3}{7}$	*Anſ.*

Note, Double work is allowed in window ſhutters; ſaſh frames and mantle-pieces are reckoned by themſelves, unleſs the mantle-pieces ſtand in the wainſcot, and then they are to be meaſured as plain work, deducting nothing for the vacancy.

Prices.	*s.*	*d.*
Common coloured, three coats in oil, per yard,	0	6
An old colour,	0	4
Walnut-tree colour,	1	0
Marble colour, from 16*d.* to	2	0
Saſh-frames, each,	1	0
Saſh lights, each,	0	1
Window lights, one with another,	0	3
Iron caſements,	0	3

Joiner's Work.

WAINSCOTING, the dimenſions are taken as in painting, viz. by meaſuring the height (indenting the ſtring wherever the plain goes, as well as the painters do wherever the bruſh goes), and then the compaſs; which multiply one into the other, dividing the product by 9, and the quotient is the anſwer in ſquare yards.

Example. What is the content of a piece of wainſcoting that is 9 feet 3 long, and 6 feet 6 broad?

Feet.	*In.*	
9	3	
6 feet	6	
55	6	
$6\frac{1}{2}$ inch. 4	$7\frac{1}{2}$	
9) 60	$1\frac{1}{2}$	($6\frac{3}{7}$ yds. *Anſ.*
54		
6.		

The length and breadth being multiplied together, brings it into ſquare feet; which divided by 9, (the ſquare feet in a yard), produces $6\frac{3}{7}$ yards for the anſwer.

By Croſs Multiplication thus:

Feet.	*In.*
9	3
6	6
54	0
4	6
1	6
0	1½
60	1½ as before, which divide by 9, &c.

Once more.

There is a room wainſcoted, the compaſs of which is 47 feet 3 inches, and the height 7 feet 6 inches; what is the content in ſquare yards? *Anſ.* 39½ yards.

	Feet.	*Inches.*	
	47	3	compaſs.
	7	6	height.
	330	9	
6½ inch.	23	7½	
9)	354	4½	

39¾ or ¼ yards.

The prices per yard.

	s.	*d.*
For good wainſcot,	6	
Wainſcoting, not finding ſtuff, &c.	2	
Coarſe wainſcoting,	1	
Deal wainſcoting, finding ſtuff,	3	
——— Not finding ſtuff,	1	

Carpenter's Work.

ROOFING, flooring, and partitioning, the principal carpentry in modern buildings, are meaſured by the ſquare of 10 feet each way, that is, 100 ſquare feet.

For roofing, multiply the depth and half-depth by the front, or the front and half-front by the depth, and you will have the contents.

The dimenſions are taken in feet and inches.

Examples.

How many ſquares doth that piece of work contain that meaſures 199 feet 10 inches in length, and 10 feet 7 inches in height? *Anſ.* 21 ſquares, 14 feet, 10½ inches.

Operation

Operation.

Feet.	*In.*	
199	10	long
	10	F. 7 high.
1998	4	
99	11	
16	$7\frac{10}{12}$	

The diviſion is performed by pointing off two places towards the right hand, and the number on the left are ſquares, &c.

Anſ. 21, 14 $10\frac{10}{12}$ 21 ſquares, 14 feet, $10\frac{10}{12}$ inches.

Again, If a floor be 49 feet 7 inches, 4 parts long, and 26 feet 6 inches broad, how many ſquare feet?

The Operation by Croſs Multiplication.

Feet.	*Inches.*	*Parts.*
49	7	4
26	6	0
294	0	0
98	0	0
15	2	0
24	6	0
	3	6
	8	8
	0	2
13,14	8	4

Anſ. 13 ſqu. 14 feet, 8 inch. 4 pts.

Note, In meaſuring roofing, no deduction is made for ſky-lights, chimney-ſhafts, &c.

In meaſuring flooring, from the content of the whole floor, in feet, take the content of the vacancy, for the ſtairs, hearths, &c. in feet, and the remainder is the true content; which bring into ſquares as before.

Note, In partitioning, you muſt meaſure the doors, door-caſes, and windows by themſelves, and deduct their content out of the whole, except by agreement they are included; and then you muſt mention it in the written agreement, doors, door-caſes, and windows included.

There are divers ſorts of carpenter's works belonging to a building, viz. Cantaliver cornice, modilion cornice, plain cornice, guttering, rail and balluſters, lintel, pent-houſe cornice, timber front, ſtory, breſt-ſommers, ſhelving, dreſſering, &c. all which are meaſured by lineal or running meaſure. There are alſo doors and door caſes, lantern lights with their ornaments, balcony doors, and caſes

caſes, cellar doors and curbs, columns and pilaſters, cu
polas, &c. all which are valued by the piece.

Carpenter's Work is done at the following prices, viz.

	l.	*s.*
Flooring, finding boards, the ſquare -	1	15
Not finding boards, from 2*s.* 6*d.* to -	0	6
Roofing with oak - - -	2	0
Not finding timber - -	0	12
Partitioning per ſquare - - -	0	15
Not finding timber - -	0	7
Stair with rails and balluſters complete	1	10
Sawing of oak, and elm, per 100 feet	0	2
Fences for trees - - -	0	2

Oak timber is commonly ſold for 40*s.* per tun (that i
40 ſolid feet) in the place; aſh 30*s.* and elm 28*s.* pe
tun.

Note, Carpenters meaſure the timber frames of an
building (which they call the carcaſe) by the ſquare o
10 ſuperficial meaſure, or 100 ſquare feet, as hinted be
fore.

Sawyer's Work.

IN this place it may not be improper to ſay ſomethin
in relation to the method uſed by ſawyers, in meaſure
ing their work. When they work by the great (a
they ſay), moſt commonly they meaſure their work b
the ſuperficial foot, ſo there is no great difficulty in take
ing the dimenſions; for they account the depth of th
kerf for the breadth, and the length for the length
The dimenſions being thus taken in feet, the content o
one kerf ſuperficial may be found by multiplying th
the length by the breadth; and then having found th
number of feet in one kerf, multiply it by the number o
kerfs, of the ſame dimenſions, and you will have th
number of feet in them all.

Note 1ſt, When thus they have caſt up the whole co
tent of their work in feet, they are paid for it by th
hundred, that is, 100 feet.

2*dly*, That if the kerf be but ſix inches or leſs in depth
then they have a cuſtom to be paid for kerf and half, (a
they expreſs it) *i. e.* for half ſo much more as it com
to by meaſur; and the reaſon they give for it is, tha
the trouble is ſo much the more on account of ofte
ſhifting, or removing and new binding their timber, an
therefore they inſiſt on it, as a cuſtomary price.

3*dly*

3*dly*, For breaking work, that is, for cutting a piece of timber or tree through the middle, and ſlabbing it, (*i. e.* cutting off the outſide piece) if the kerf be more than 12 or 13 inches deep, they are paid by the foot lineal or running meaſure, at different prices, according to the various depths of the kerf; and are as follows:

Inches deep.	*d. qrs.*	
15	1	
18	1 2	
20	2	
22	2 2	
24	3	
26	3 2	per foot.
28	4	
30	4 2	
32	5	
34	5 2	
36	6	

4*thly*, In ſome places it is cuſtomary to allow the ſawyer but one breaking kerf in a tree, though there be never ſo many kerfs deep in it. But ſome ſawers claim to have half breaking work, and half hundred work; that is, if they have four kerfs deep, then they will have two breaking work, and the other two hundred work.

5*thly*, In ſawing bevil work, as hipps, ſleepers, &c. poſt, &c. in bevil frames, poſts, or puncheons in polygonal turrets, &c alſo cantrails, &c. for theſe they work by the hundred, but always reckon kerf and half for ſuch ſort of work; that is, they reckon half as many more feet of work than there is really performed.

Bricklayer's and Tiler's work.

Of Walling.

WALLING is meaſured by the rod ſtatute-meaſure, being 272 feet and ¼ ſuperficial. The method of taking their dimenſions is thus: For a wall round an orchard, or the like, they meaſure the length by a line, going over the buttreſſes; and for the height they meaſure over the mouldings (preſſing the line into them) even to the middle of the coping; they likewiſe take notice of the thickneſs of the wall, that is, how many half bricks in length the wall is in thickneſs; for three half bricks, that is a brick in length, and one in breadth.

is ſtandard thickneſs: and all walls, whether leſs or more muſt be reduced to that thickneſs, by this rule, viz. Multiply the product of the length and height, by the number of half bricks that the wall is in thickneſs; which product divide by 3, and then the quotient by 272 (the $\frac{1}{2}$ being generally neglected in vulgar working) and the quotient will be rods, at a brick and a half thick ſtandard-meaſure.

Example.

Admit the face of the wall meaſure 4085 feet, and the thickneſs be two bricks and a half, or five half bricks thick, how many rods doth it contain?

4085
5
3) 20425
272) 6808 (25 rods, *Anſ.*
1368
(8)

When the work is wrought decimally, then you divide by $272\frac{1}{2}$, or 272,25, which gives the quotient ſomewhat leſs. But the meaſuring of brick work may be ſhortened, by having the rod of 16 feet $\frac{1}{2}$ centeſimally divided into 100 equal parts, with which you take the dimenſions, and the length of the wall in thoſe rods; and 100 parts multiplied by the height give the content in rods, of any wall that is a brick and half thick. Deduction muſt be made for doors, windows, &c.

A table to reduce brick work to ſtandard meaſure, *i. e.* a brick and half thick.

Brick.			
1	Subtract $\frac{1}{3}$		Reduce to a brick and half.
2	Add $\frac{1}{3}$		
3	Multip. by	2	
$4\frac{1}{3}$		3	
6		4	

Example.

Suppoſe a garden wall to be 254 feet round, and 12 feet 7 inches high, and three bricks thick, how many rods doth it contain?

254

	254		In this operation the aggregate, or total, is multiplied by 2, becauſe twice 3 is 6, the number of half-bricks; and that reduces the work to ſtandard meaſure, as by the table above.
	12		
In.	3048		
6ths	127		
12ths	21	2	
	3196	2	

272) 6392 4 (23 $\frac{1}{2}$ rods.

Of Chimneys.

This brick work is commonly agreed for by the earth, and alſo ſometimes by the rod; and the method of taking dimenſions is thus: If the chimney ſtands ſingle, not leaning againſt, or being in a wall, and work-ſ upright over the mantle tree, to the next floor, it is ken about the breaſt for the length, and the height of the ſtory is taken for the breadth, and the thickneſs of the jaumbs for the thickneſs. But if the chimney ſtands againſt, or in a wall, which is before meaſured with the reſt of the building, then the breadth of the breaſt or ſtack, together with the depth of the two jaumbs, is the length, the height of the ſtory the breadth, and the thickneſs of the jaumbs the thickneſs. But if the chimney ſtands in the corner of a room, and has no jaumbs, then the breadth of the breaſt is the breadth, the height of the ſtory the length, and the thickneſs the thickneſs. And for the ſhaft, it is commonly girt in the ſmalleſt part, for the length; for the length; and the thickneſs of both ſides, for the thickneſs; in conſideration of the arches, pargiting, ſcaffolding, &c.

Note, *There is nothing to be deducted for the vacancy between the hearth and the mantle tree, becauſe of the widths of the thickening for the next hearth above.*

Gable Ends.

Take half the perpendicular for the breadth, and the length of the houſe for the length, or half the width of the houſe for the breadth, and the perpendicular for the length, which brings the meaſure to an oblong, the contents of which is found by multiplying the length by the breadth, &c.

Note, *There are ſeveral other things in bricklayer's work; as cornice, facias, ſtraight arches, cheme arches, hips and valleys, in tiling and water courſes: All which*

are

are meaſured by the foot lineal, or running meaſure. Al piers, pilaſters, ruſtic work, &c. *which are valued by t piece.*

Prices.	l.	s.	d.
For walls, finding materials -	5	0	0 per rod.
Not finding materials -	1	10	0 ditto.
For tiling, finding materials	1	5	0 per ſqu.
Not finding materials -	0	5	0 ditto.
For tiling, finding materials, except tiles,	0	10	0 per rod.
For ſtripping without taking down,	0	5	6 ditto.
With taking down, -	0	7	0 ditto.
For pointing - -	0	2	0 ditto.

Paving.

Pavement for cellars, waſh houſes, &c. is meaſured the ſquare yard.

Example.

If a cellar, waſh houſe, or court yard be paved w bricks, or pitched with pebble, being 9 yards 2 feet lon and 6 yards 2 feet broad; how many yards ſquare do it contain? *Anſwer*, 64 yards 1 and $\frac{1}{4}$ feet, as by the f lowing work.

Yds.	*F.*
9	2
6	2
54	0
6	0
4	0
	$1\frac{1}{4}$
64	$1\frac{1}{4}$ *Anſ.*

Yds	*F.*
9	2
6 yards 2.	
57	0
3	0 8
3	0 8
64	$1\frac{1}{4}$

Feet.

29
20

9) 580

Yds. $64\frac{1}{4}$

Here the anſwer is found by th different operations, and the reſult each is the ſame.

Slating.

Is valued by the ſquare of 100 feet; in ſome pl by the rod of 18 feet ſquare; that is, 36 ſquare ya or 324 feet.

☞ In tiling and ſlating, where there are gutters and valleys, there is commonly an allowance, which is to take the length of the roof all along upon the ridge, which makes the gutter double meaſure; which in ſome places is allowed, in others not. Sometimes there is an addition for hollow ware, that is, ridge-tiles, gutter-tiles, corner and dormar tiles: and here cuſtoms differ; for, in ſome places they count one ſuperficial foot for every foot lineal or running meaſure; then 100 feet lineal is reckoned a ſquare. In other places, for every 100 of ſuch tiles they reckon one ſquare.

Plaiſtering

Is of two kinds, viz. *Firſt*, Work lathed and plaiſtered, ſometimes called Ceiling. *Secondly*, Plaiſtering upon brick work, or between the quarters in partitioning, by ſome called Rendering; both which are meaſured by the yard ſquare, as the joiners and painters do. In taking dimenſions of ceiling, if the room be wainſcoted, they conſider how far the cornice bears into the room, by putting up a ſtick perpendicular to the ceiling, cloſe to the edge of the uppermoſt part of the cornice; and meaſure the diſtance from the perpendicular ſtick to the wainſcot; twice which diſtance muſt be deducted from the length and breadth of the room taken upon the floor, and the remainder is the true length and breadth of the ceiling: As ſuppoſe a floor is 24 feet long, and 18 feet broad, and the cornice ſhoots out ſix inches deduct a foot for both ends, and the length of the ceiling is 23 feet; and the ſame for the breadth; it leaves 17 feet broad; which multiplied together, gives the content, 391 feet, or 43 yards and a half.

Example.

23 feet the length.
17 feet broad.

161
23

9) 391 (43 yards, 4 feet.
36

31
27

4

If the ceiling of a room be 19 feet 10 one way, 17 feet 6 the other, how many ſquare yards does it contain? By Croſs Multiplication, thus:

19 10
17 6

133
19
14 2
9 6
5

9) 347 1 (38 yds. 5 feet 1 inch.

How many yards ſquare are there in a piece of plaiſtering that is 47 feet 4 inches 7 parts long, and 18 feet broad?

F.	*I.*	*Pts.*	
47	4	7	
		3	times 6 is 18.
142	1	9	
		6	

9) 852 10 6 (94 yds. 6 feet, 10 inch. 6 parts.

Prices per yard.

	s.
For every yard of common plaiſtering, finding lath, nails, &c.	0
Not finding laths	0
For white waſhing with ſize	0
Partitioning, finding all materials	0

Maſon's Work.

THE Maſon's work, conſiſting of ſtone, is of two ſorts, viz. ſuperficial and ſolid. Pavements, and the face of ſtone walls, houſes, &c, are meaſured as brick work. If the work have ornaments, as capitals, pilaſters, rails, and balluſters, &c. then they are valued by the piece.

	s.
For every foot of plain work in walls, &c.	0
For plain cornice, about	1
For rough ſtone wall, with lime, 16½ feet long, and 1 foot high, per rod	1
Without lime, per rod	0
Paving, digging the ſtone, and all workmanſhip, per ſquare foot	0

Pri

Prices of Stone and Urns.

Rough paving 1d. per foot; rough aſhlar, or coping, d. per foot; fine aſhlar, 3d. per foot; baſe per foot, carbe per foot, 6d. urns 3 feet high, 1l.; 4 feet high, 10s.; 5 feet high, 2l.; and 6 feet high, 3l.

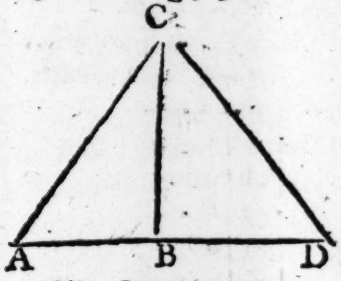
Land Meaſure.

AND is uſually meaſured by the acre. The dimenſions are taken with a chain of four poles in length, ich is divided into 100 parts, called Links, and 10 are chains make an acre. Let them be 10 in length, 1 in breadth, or 5 in length and 2 in breadth, &c. 160 ſquare poles; but to find its content (if not regu- ſquare) it is generally divided into triangles. Thus ece of land of four ſides, (if not ſquare) may be di- d into two triangles, pieces of 5 ſides into 3, and a ded piece into 4 triangles.

To meaſure a Triangle.

Admit the longeſt ſide of the following triangle, viz. D to be 76 poles, and the perpendicular or middle line C to be 30 poles, multiply 76 (the baſe) by 15 the f of the perpendicular B C, and it produces 1140; or, ou multiply the whole perpendicular by half the baſe, longeſt ſide) it will produce the ſame; which di- d by 160, (the ſquare poles in an acre) the quotient s the content of that piece of land in acres; and t remains multiply by 4, and divide by the ſame di- r, and it quotes roods, &c.

Note, *Always the perpendicular is drawn from the op- e angle to the baſe, or longeſt ſide, as in the following re.*



The Operation.

76 the baſe
15 half the perpendicular.

160) 1140 (7 acres $\frac{2}{10}$, or $\frac{1}{5}$.
1120
20

All other pieces of land (for the moſt part) muſt be di-
vided into triangles, and when meaſured, their content
added together.

Suppoſe an oblong plat of ground contains 35 pole
broad, and 185 poles long; how many acres is the con-
tent? *Rule.*

Multiply the length in poles by the breadth, and divid
the product by 160, (the ſquare poles in an acre) an
the quotient will be the anſwer in acres; and if the re
mainder

Be { 120 / 80 / 40 } its value is { ¼ / ½ / ½ } of an acre.

The work.

185 the length.
35 the breadth.

925
555

160) 6475 (40 acres
640

75
Deduct 40 a quarter.

35 poles remain.

The content is 40 acres
and 35 poles, or almo
40 acres and a half.

By the four pole chain.

Example. There is a plat of ground which conta
16 chains and 25 links in breadth, and 57 chains and
links in length; what is the content of that piece of lan

C. Link.
57, 30 length.
16, 25 breadth.

28650
11460
34380
5730

Acres 92|11250 cut off two places.
4

No roods, 45000
40

Poles 18|000(93 ac. 0 rood, 18 poles, *Anſ.*

Note, 4 roods or rods is one acre, 40 poles 1 rood or rod, ſo that one rood or rod is 1 quarter of an acre.

Note alſo, That the above chain, commonly called *Gunter's chain*, contains 4 ſtatute poles in 100 links, ſo that any number of chains are no more than ſo many 100 links: 160 ſtatute poles are an acre, each pole being 16 feet and an half; therefore in a ſquare chain there are 16 ſquare poles; and if you divide the 160 (the ſquare poles in an acre) by 16, (the ſquare poles in a chain) the quotient is 10, the ſquare chains in an acre.

A ſquare chain contains 10,000 ſquare links, (or 100 multiplied by 100) and therefore it follows, that an acre contains 100,000 ſquare links.

To reduce ſtatute to cuſtomary meaſure.

According to a ſtatute made in the 33d of Edward the firſt, and another in the 25th of Queen Elizabeth, a ſtatute pole is 16 feet and a half long (as ſaid before); but in divers parts of England there are uſed poles of 18, others of 21, and ſome of 24 feet long, called cuſtomary meaſure, being in uſe according to the humour or cuſtom of the place where they are taken. To turn therefore one ſort of meaſure into the other, admit ſtatute meaſure to be turned into cuſtomary, do thus: Multiply the number of acres, roods, and poles, ſtatute meaſure, by the ſquare half-yards, or ſquare half-feet, in a ſquare pole ſtatute meaſure, and divide the product by the ſquare half-yards, or ſquare half-feet, contained in the pole of the meaſure cuſtomary, and the quotient gives the anſwer in the latter, in acres, roods, &c.

Example. In 172 acres ſtatute meaſure, how many acres of 18 feet to the pole or perch?

Acres 172 ſtatute meaſure.
121 ſquare half-yards.

144) 20812 (144 $\frac{76}{144}$ acres cuſtomary meaſure.

In a ſtatute pole are 11 half-yards, which ſquared make 121 ſquare half yards; and in a ſquare pole of 18 feet are 144 ſquare half-yards, &c. For the remainder work as before, viz. by multiplying it by 4, &c. and the next remainder by 40, &c. as ſpoke to before: So that the anſwer is, that 172 acres ſtatute meaſure, make 144 acres 2 roods and 4 poles of ſuch cuſtomary meaſure.

An example of the contrary.

In 543 cuſtomary acres of 18 feet to the pole, how many acres of ſtatute meaſure, being 16 feet and an half to the pole?

543 cuſtomary.
144 ſquare half-yards in a cuſtomary acre.

2172
2172
543

121) 78192 (646 ſtatute acres.
726

55, &c.

The remainder 26 multiplied by 4, produces 104 which not amounting to a rood, ſhould be multiplied by 40, their product is 4160; which divided by 121, quotes 34 perches, and 46 remains. So the anſwer is, that 543 cuſtomary acres, of 18 feet to the pole, make 646 acres, 34 poles, and $\frac{46}{121}$ of a pole.

Note, cuſtomary acres, as well as ſtatute acres, contain 160 ſquare poles, or perches; the exceſs of bigneſs is by the bigneſs of the pole.

Solid Meaſure.

IS that of timber, ſtone, digging, liquids, &c.; and the rule for working is, to multiply the length, taken in inches, and the breadth together, and then that product by the depth or thickneſs, and the laſt product will be the content in cubic inches; which, if timber or ſtone, divide by 1728, (the cubic inches in a foot ſolid) and the quotient gives the content in ſolid feet.

Example. If a tree be 16 feet long, and 18 inches ſquare, how many ſolid feet doth it contain?

Multiply { 18 / 18 } 324

16
12
192 the length in inches.
324 breadth and thickneſs.

768
384
576

1728) 62208 (36 feet.
5184
10368
(0)

Decimally

Decimally.		By practice.	
Square.	1,5	1	7
	1,5		1 6
	2,25 breadth.	1	6
	16 length 6¼ inches		9
	36,00 *Anſ.*	2	3
			4 times 4 is 16.
		9	0
		Feet 36	0 *Anſ.*

In ſolid meaſure,

40 feet of round } timber is a ton or load.
50 —— of hewn }

1728 inches is a foot of ſtone or timber.
27 feet is a yard.
282 inches is a gallon of ale or beer.
231 inches is a gallon of wine.

Suppoſe there is given an oblong piece of timber, whoſe breadth is 2,25, and thickneſs 1,64 feet, and length 36,5 feet, how many ſolid feet are contained therein?

2,25 breadth.
1,64 thickneſs.

900
1350
225

3,6900
36,5 length.

184500
221400
110700

134,685 00 *Anſ.* 134,685 ſolid feet, or 134⅝ nearly.

Of Timber Meaſure.

WHEN at any time you would know the content of any piece of timber by vulgar or decimal arithmetic, obſerve what follows, viz. The tree being girted, and one-fourth part taken for the ſide of the ſquare

ſquare; multiply the length of the ſide of the ſquare in inches into itſelf, and that product by the length in feet; which laſt product divide by 144; but if you multiply by the length in inches, then your diviſor muſt be 1728; and if any thing remains, divide ſuch remainder by 12, and the quotient will be the odd inches.

Example.

Suppoſe a piece of timber 15 feet long, and a quarter of the girt 42 inches; what is the content of that piece?

The Work.

42 inches the ſide of the ſquare.

42

84

168

1764

15 feet in length.

F. I.

144) 26460 (183 9 *Anſ.*

144

1206

1152

540

432

12) 108 (9 inches.

(0)

Note, In this example 1764 is multiplied by 15 in one line.

But the foregoing example may be worked ſhorter by decimals, thus:

Squared { 3,5 the ſide of the ſquare 42 inches. 3,5

175

105

12,25 the product are feet.

15 feet the length.

6125

1225

183,75 the cont. viz. 183 $\frac{75}{100}$ or $\frac{3}{4}$ as before

By

By this common way of taking $\frac{1}{4}$ of the compaſs for the ſide of a ſquare, which is equal to the content of the circle in round timber, is erroneous, and gives the ſolidity ſomewhat leſs than the true content: But the true way is, to multiply half the diameter by half the compaſs, and then that product multiply by the length, which divide by 1728, and the quotient is the content. If you cannot come to meaſure the end of the piece, you may know the diameter by this proportion, viz. as 22 is to 7, ſo is the compaſs to the diameter.

Or, you may find the ſide of a ſquare of a round piece of timber by this rule, viz. multiply 2821 by the inches of the compaſs, and cut off 4 figures to the right hand of the product.

2821
Inch. 66 the compaſs
16926
16926
18|6186 *Anſ.* $18\frac{6}{10}$ in. (nearly.

Having the breadth and depth of a piece of timber or ſtone, to know how much in length of it will make a ſolid foot; multiply one by the other, and let the product be a diviſor to 1728, thus:

24 broad.
18 thick.

192
24

432) 1728 (4 inches in length.
1728

And thus you may make a table to ſerve all breadths and depths, by which much labour may be ſaved in multiplying and dividing, and yet meaſure any piece of timber thereby very exactly.

In ſquare timber, you muſt make the inches ſquared a diviſor to 1728, and the quotient will be the anſwer in inches of length, and that will make a foot ſolid.

Example.

If a piece of timber be 8 inches ſquare, what length of it will make a foot?

64) 1728 (27 *Anſ.* 27 inches, or 2 feet, 3 inches in length.
128
448
448
(0)

Here the ſquare of 8 is 64, &c. Again,

Again, ſuppoſe a piece be 18 inches ſquare, what length will make a foot? *Anſ.* $5\frac{1}{9}$ inches.

The ſquare of 18 is 324) 1728 ($5\frac{108}{324}$ equal to $\frac{1}{3}$.

1620

(108)

The uſual way for tapering timber is by this method, viz. Take the dimenſions in the middle, and multiply that by the length, which is not accurate; but if the dimenſions be taken in ſeveral places, and the mean be uſed, the content thus found will be near the truth.

Digging.

IS meaſured by the ſolid yard of 27 feet, that is 3 times 3 is 9, and 3 times 9 is 27, by which are meaſured vaults, cellars, clay for bricks, &c. Other things are meaſured by the floor of 324 ſolid feet.

Example 1.

If a vault or cellar be digged 9 feet deep, $4\frac{1}{4}$ feet long, and 3 feet 9 inches broad, what is its content in ſolid yards?

Feet.

$4\frac{1}{4}$ long.
9 deep.

$40\frac{1}{4}$
3 feet 9 broad.

$121\frac{1}{4}$
6 inches $\frac{1}{4}$. $20\frac{1}{4}$
3 is $\frac{1}{2}$ of 6 10

27) $151\frac{1}{4}$ (5 yards $16\frac{1}{4}$ feet.

16

Example 2.

How many yards of digging will there be in a vault that is 25 feet 4 long, 15 feet 8 broad, and $7\frac{1}{2}$ feet deep?

25

25 4
3 times 5 is 15

76 0
5

4 feet is $\frac{1}{3}$ 380 0
4 feet is $\frac{1}{3}$ 8 $5\frac{1}{3}$
8 $5\frac{1}{3}$

396 $10\frac{2}{3}$
$7\frac{1}{2}$

2778 $2\frac{1}{2}$
198 $5\frac{1}{3}$

Yd. F. In.
27) 2976 8 0 (110 6 8

27

6

Example 3.

There is a moat that is 648 feet long, 24 feet broad, and 9 feet deep, how many floors?

648 long.
24 broad.

2592
1296

15552
9

Divide by 324) 139968 (432 floors. *Anſ.*
&c.

(o)

Solid bodies being frequently painted, it is neceſſary to know how to find their ſuperficiality. To know the ſuperficial content of a ſquare, or many-ſided, or round pillar, multiply the ſum of the ſides, or circumference, by the height in feet, and the product divided by 9 will be ſquare yards.

Of

Of a Globe.

Multiply the circumference in feet by itself, and the that product by this decimal 0,0353678, and this la product will be the content in yards.

To find the superficial content of a pyramid or con multiply half the sum of the sides, or half the circum ference of the base by the slant height, in feet, and th product, divided by 9, will be square yards.

If the pyramid or cone be not complete, that is, if part of the top be wanting, add together the circumf rences at top and bottom, and half their sum, being mu tiplied by the slant height, will be the superficial conten

Note, A solid yard square of clay will make about 7 800 bricks, and the price of making is 7 or 8*s*. a tho sand; 3 bags (or bushels) and half of lime, and half load of sand, will lay 1000 bricks.

500 bricks } make a loa
1000 plain tiles }
25 bags 1 *C.* of Lime.

IT may not here be improper, as well for refreshi the memory, as for improving the understanding, a forming the mind with proper notions and ideas of me suring, to give a short repetition, by demonstrative ge metrical figures, to explain what hath been verbally a arithmetically before expressed.

And first, for Planometry, or Superficial or Flat M sure, some of which is measured by the foot square; boards, glass, marble, free stone, and pavements. T dimensions are taken in feet and inches, and the cont given in square feet. *Example* 1.

Suppose there is an oblong or long square, let it board, glass, or pavement, &c. that contains on longest side (or the length) $24\frac{1}{4}$ feet, and the shor side (or breadth) $14\frac{1}{4}$ feet, as in the following figure,

$14\frac{1}{4}$ feet | Feet $24\frac{1}{4}$ Area or content is 349 F. 125

14,25 breadth.
24,5 length.

7125
5700
2850

349,125

Rule. Multiply the length by the breadth, and cut off as many places to the right hand as there are decimals in the length and breadth.

Example 2.

Suppoſe a board or piece of glaſs be in the form of Figure the Firſt, called Rhombus, that is, in the ſhape of a common pane of glaſs, or diamond ſquare.

Rule To meaſure which, multiply the breadth A B by the length of any of the ſides, (for they are all equal), and cut off as many places to the right hand as there are decimal places in both multiplicand and multiplier, as hinted before; as ſuppoſe the breadth A B 8 feet 38 parts, and the length of the ſide to be 8 feet 52 parts, then the work will appear thus:

F. P.	
8,52	Here the multiplication is as in whole numbers, and the content or anſwer is found to be 71 ſquare feet, and $\frac{3976}{10000}$ ten thouſands of a foot, or 4 inches $\frac{1}{4}$.
8,38	
6816	
2556	
6816	
71,3976	

3976 is ſeparated by a comma, as above directed, and are ſo many 10000 parts of a foot.

Example 3.

Again admit a piece of meaſurement to be of the form of Figure the Second, called a Rhomboides; its length 17 feet 25 parts, and its breadth 8 feet 58 parts.

F. P	
17,25 length.	The forementioned figure hath its oppoſite ſides equal, and its oppoſite angles alike.
8,58 breadth.	
13800	
8625	
3800	
148,0050	

Anſ. the content is 148 feet.

Once more.

Suppoſe a board, piece of glaſs, pavement, or piece of land, to repreſent, or be in the form of a triangle, or three cornered figure, expreſſed as in the ſhape of Figure the Third. Every triangle is half an oblong, whoſe right hand breadth is equal to the perpendicular, and baſe.

Note, The dotted line is the perpendicular, the bottom line the baſe, and the line from the top of the perpendicular to the left angle of the baſe is called the hypothenuſe.

The meaſuring of a triangle hath been already ſhewn, and therefore I ſhall deſiſt ſpeaking any further thereto.

The Fourth Figure is called a Trapezium, and conſiſts of 4 ſides; this figure, before it can be meaſured, muſt be divided into two triangles, thus, viz. by a line drawn from one angle or corner, to the angle oppoſite to it, as in the figure.

Example 4.

Suppoſe the dimenſions of the trapezium before deſcribed to be, viz. the baſe 16 *F.* 67; the one perpendicular 12 *F.* 50, and the other 9 *F.* 68 (as in figure 5) what is the content;

The Operation.	*F.*	*P.*	
One perpendicular	12,	50	add
The other	9,	68	
The ſum is	22,	18	
The half ſum is	11,	09	which
Multiply by the whole baſe	16,	67	

produces 184,8703

which is 184 feet, and $\frac{8703}{10000}$ of a foot, equal to 10 inches and an half.

Note, If two ſides of a trapezium are parallel, that is, equidiſtant, then add them together, and half the ſum multiplied by the neareſt diſtance between thoſe two ſides gives the content. Or, if you meaſure in the middle between two ſides or lines that are of equal length, the anſwer will be the ſame.

Note alſo, The painting, plaiſtering, *&c.* of irregular pieces in the forms of triangles, or not, if divided as above, may be meaſured as before; and brought into yards (if the content is to be ſo given in) by dividing by 9, as before ſhewn.

Of Regular Figures.

FIGURES that have more than four ſides, are called Polygons, and thoſe of them that have their ſides and angles equal, are called *regular polygons*.

Regular

Regular polygons have their names from the number of their ſides; thus a figure having

3	equal ſides, is called a	Trigon, or equilateral triangle.
4		Tetragon, or ſquare.
5		Pentagon.
6		Hexagon.
7		Heptagon.
8		Octagon.
9		Nonagon.
10		Decagon.
11		Undecagon.
12		Dodecagon.
15		Quindecagon.

The area of a pentagon may be found by multiplying the ſquare of its ſide by the number 1,7204774.

Thus, if the ſide of a pentagon be 11 feet, then the ſquare thereof will be 11 times 11, or 121 feet.

Multiply by 1,7204774
121

17204774
43409548
17204774

208,1777654

Therefore the area of the Pentagon will be upwards of 208 ſquare feet.

In like manner, to find the area of the

Trigon,	multiply the ſquare of the ſide by	0,4330127
Tetragon,		1,0000000
Hexagon,		2,5980762
Heptagon,		3,6339124
Octagon,		4,8284271
Nonagon,		6,1818242
Decagon,		7,6942088
Undecagon,		9,3656404
Dodecagon,		11,1961524

Of a Circle.

See Figure the ninth.

A Circle is contained under one line, called the *circumference* or *periphery*, as *A B C*. All right lines drawn from the centre *E* to the circumference, are equal, and called *radiuſes*, or *half-diameters*; and the

long line through the centre from *A* to *C* is the diame
ter.

To divide a circle in 6 equal parts, extend the com
paſſes to half the diameter, as from *A* to the centre *A*
and the extent applied to the circumference will divide i
into thoſe parts.

The diameter *A C* divides the circle into two equ
parts, each of which is called a *ſemicircle*; and if a ſe
micircle be divided into two equal parts, thoſe parts ar
called *quadrants*.

The queſtions relating to the meaſuring of the circ
and its parts may be ſolved as follows;

1. The diameter being given, to find the circumfe
rence.

Rule. Multiply the number 3,1415927 by the diam
ter, and the product will be the circumference.

Note, The number 3,1416 will be exact enough i
moſt caſes.

Example.

The diameter of a circle being 11 inches, what is i
circumference?

3,1416
11

3,1416
3,1416

Anſ. 34,5576 (or above 34$\frac{7}{8}$) inches.

2. The diameter being given, to find the area.

Rule. Multiply the number 0,7853982 (or in comm
caſes 0,7854) by the ſquare of the diam.ter, and the pr
duct will be the area.

Example.

What is the area of that circle whoſe diameter is
inches?

11 times 11 is 121

0,7854
121

7854
15708
7854

Anſwer, 95,0334 ſquare inches.

3. T

3. The circumference being given, to find the diameter.

Rule. Multiply the number 0,3183099 (or in common 0,31831) by the circumference, and the product will be the diameter.

Example. What is the diameter of that circle whose circumference is 34½ inches?

34½—34,5

0,31831
34,5

159155
127324
95493

Anſ. 10,981695 (or almoſt 11) in.

3. The circumference of a circle being given, to find its area.

Rule. Multiply the number 0,0795775 (or in common 0,0796) by the ſquare of the circumference, the product will be the area.

Example. What is the area of a circle whoſe circumference is 34½ inches?

34,5
34,5

1725
1380
1045

1190,25

1190,25
0,0796

714150
1071225
833175

Anſ. 94,743900 (or almoſt 95) ſqu. inch.

5. The area of a circle being given, to find its diameter.

Rule. Multiply the ſquare root of the area by the number 1,12837, and the product will be the diameter.

Example. What is the diameter of that circle whoſe area is 95,0334 ſquare inches?

95,0334 (9,75
81

187) 1403
1309

1945) 9434
9725

1,12837
9,75

564185
789859
1015533

11,00160075

Anſ. The diameter is 11 inches.

6. The area of a circle being given, to find its circumference.

Rule. Multiply the ſquare root of the area by the number 3,5449, and the product will be the circumference.

Example. What is the circumference of that circle whoſe area is 95,0334 ſquare inches?

95,0334 (9,75

3,5449
9,75

177245
248143
319041

34,562775

Anſ. The circumference is 34$\frac{1}{2}$ inches.

7. To meaſure the ſector of a circle. *See figure* 10.

Caſe the firſt. If the length of the arch *D E* and the ſemidiameter, *C E* be given:

Rule. Multiply the length of the arch by $\frac{1}{2}$ the ſemidiameter, and the product will be the area.

Caſe the ſecond. If the number of degrees contained in the arch, and the ſemidiameter be given:

Rule. Multiply the ſquare of the ſemidiameter by the number of degrees contained in the arch, and that product by the number 0,00087267, and the reſult will be the area required.

Example. Let the arch conſiſt of 90 degrees, or $\frac{1}{4}$ of the circumference, and the ſemidiameter be 3$\frac{1}{2}$

2,5	12,15	0,00087267
3,5	90	1102,5
175	1102,50	436335
105		174534
		872670
12,25		872670
		9,621118675

Of Solid Meaſure.

SOLID or cube meaſure hath been already defined (as well as ſuperficial meaſure) ſome of the figures of which are numbered 6, 7, and 8.

To meaſure a ſolid in form of a cube, which hath length, breadth, and thickneſs all equal, you muſt multiply theſe into themſelves, and the laſt product gives the ſolidity or content, either of wood or ſtone. A cube hath ſix ſides, and is in ſhape like a die.

Example.

What is the ſolidity of a cube whoſe ſide is 12 inches?

12
12
144
12
1728 the ſolid inches in a ſolid foot.

To meaſure a ſolid of an unequal length, breadth, and thickneſs, multiply the length by the breadth, and that product by the height; the laſt product will be the ſolidity.

Example.

What is the ſolidity of a block of marble whoſe length is 10 feet, breadth 5½ feet, and depth 3½ feet?

5,75
3,5
2875
1725
20,125
10
201,25 the ſolidity.

The cone is meaſured by finding the ſuperficial inches of the bottom or baſe thereof; which multiply by one third of the inches in the length, and that product is the ſolid quantity in inches; which inches divide by 1728, and the quotient gives the anſwer in ſolid feet.

Example of finding the ſolidity of the cone, decimally without dividing by 1728.

Let the diameter of the baſe be 2 feet 6 inches, and the altitude 10 feet 6 inches.

2,5

2,5 the diameter,
2,5

125
50

6,25 the ſquare of the diameter.
,7854

2500
3125
5000
4375

4,908750 the area of the baſe.
3,5 one third of the height.

24543750
14726250

17,1806250 the ſolidity in feet.

This method may ſerve for tapering timber, or ſ any other thing of that ſhape repreſented in figure 7.

To meaſure a Pyramid.

Rule. Multiply the area of the baſe or bottom by o third of the perpendicular height, and the laſt produ will be the content in ſolid feet: or, one third part the area at the baſe, multiplied by the whole altitud gives the content alſo.

Examples of both ways.

Suppoſe there is given a ſquare pyramid, (or figure li a ſpire ſteeple) the ſide of whoſe baſe is 4 feet and half, and the perpendicular height 8 feet, what is t ſolid content?

4,5
4,5

225
180

20,25
6½ of the altitude.

121,50 *Anſ.* 121 feet, and $\frac{50}{100}$ or $\frac{1}{2}$

6,74$\frac{1}{2}$ of 20,25 the area at the ba
18 the whole height.

5400
675

121,50 *Anſ.* 121,50, as before.

Whe

When one side of the base is longer than the other, as admit one to be 2 $\frac{1}{2}$ feet, and the other 1$\frac{1}{4}$ foot, then multiply the length of the base by the breadth, and that product by one third of the height, as before.

If the base be any polygon, find its area by the rule given in page 207; and then multiply it by $\frac{1}{3}$ of the height.

To measure the frustum or segment, i. e. a piece or part of a pyramid, whose ends are similar regular polygons.

Multiply together the sides of the greater and lesser polygons; multiply also the difference of those sides by itself; add the one third part of the second product to the first product: multiply the sum by the height, and by the number which belongs to the polygon in p. 207, so shall the last product be the solidity.

To measure the frustum or segment of a cone.

Multiply together the diameters at the top and the bottom of the frustum; multiply also their difference by itself; add one third part of the last product, to the first, and multiply the sum by the height of the frustum, and by the number 0,7853982, so shall the last product be the solidity required.

Example.

What is the solidity of the frustum of a cone; the diameter of the greater end being 4 feet, that of the lesser end 2 feet, and the height 9 feet?

4	2 diff. of diameters.
2	2
8 product of diameters.	4; $\frac{1}{3}$ of which is 1$\frac{1}{3}$.

1 added to 1$\frac{1}{3}$ is 9$\frac{1}{3}$, which multiplied by 9, the height, produces 84.

Then multiply 0,7854
by 84

31416
62832

Solidity 65,9736

Of Gauging.

THERE is a near sort of kindred or affinity between the art of measuring timber, and that of gauging or measuring of liquors; for both are performed by cube or solid measure, and therefore not improper closely to follow

follow one another. For as often as there are found 1728 ſolid or cubic inches in a piece of timber, (of what form ſoever), ſo many ſolid feet it is ſaid to contain; ſo likewiſe in the art of gauging, ſo many times as 282 (the ſolid inches in a beer or ale gallon) are found in any veſſel of ſuch liquor; ſo many gallons is ſuch a veſſel ſaid to hold, and ſo of wine; but in that the diviſor alters, being 231 ſolid or cubic inches.

And the gallon of dry meaſure contains 272¼ cubic inches.

Note, *Every cubical foot, in beer or ale meaſure contains 6 gallons and almoſt a pint.*

The ſame in wine meaſure is 7 gallons and almoſt 4 quarts.

A cubical foot of dry meaſure contains 6 gallons, and ſomewhat above one third of a gallon.

141 inches make two quarts of beer or ale, 70½ inches one quart, and 35¼ inches a pint.

To find the content of any veſſel, that hath the form of a cube, that is, a figure whoſe breadth, depth, and length are equal, and is very well repreſented by the ſhape of a die commonly played withal.

Rule. Multiply the ſide into itſelf, and then again that product by the ſide; which laſt product, if for beer or ale, divide by 282, the inches in a beer or ale gallon; and for wine, brandy, &c. by 231; the inches contained in a wine gallon. *Example.*

Suppoſe a cube, whoſe ſide is 79 inches, I demand the ſolid content in wine and beer gallons?

79	282) 493039 (1748 beer or ale gallons	
79	282...	
711	2110	Wine G
553	1974	231) 493039 (213
6241	1363	462...
79	1128	310
56169	2359	231
43689	2256	793
493039 cube inches. (103)		693
		1009
		924
		(85)

T

To find the content of a parallelopipedon, which is a solid figure contained under six sides, of which the opposites are parallel, and of form of figure the 12th.

Rule.

Multiply the length by the breadth, and that product by the depth, and then divide by 282 for beer or ale, and 231 for wine.

Example.

Admit the length to be 95 inches, and the breadth 62 inches, and the depth 23 inches, what is the content in wine and beer gallons?

```
                                95 length.
231) 135470 (586 wine gal.      62 breadth.
     1155..
     ----                       ---
     1997                      190
                               570
     &c.                       ---
Rem. (104)                    5890
                                23 depth.
                              -----
                              17670
                              11780
                              -----
                282) 135470 (480 beer gal.
                     1128
                     ----
                     &c.
                     ----
                Rem. (110)
```

To gauge a back or square tun.

Example.

Suppose its length 112 inches, breadth 72 inches, and its depth 48 inches, what is its content in solid inches, and also its content in beer gallons?

```
112 length.        282) 387072 (1372 gallons, Anſ.
 72 breadth.            282...
---                     ----
224                     1050
784                      846
----                    ----
8064                    2047
 48 depth.              1974
----                    ----
64512                    732
32256                    564
------                  ----
387072                  (168)
```

To

To bring these gallons into barrels, divide them by 36 the gallons in a barrel of beer, thus:

36) 1372 (38
108
292
288
(4)

Ans. 38 barrels and $\frac{4}{36}$ of a barrel: and for the remainder 168, it is something above half a gallon.

Note, *That the duty of excise upon strong beer and ale is* 6s. *and* 6d. per *barrel. Brewers are allowed* 3 *barrels in* 23 *for leakage*, &c *both for strong and small beer and for ale* 2 *in* 22; *so that the neat excise of a barrel of strong beer, to be paid by the common brewers is* 5 $7\frac{1}{4}$. *and* $\frac{7}{23}$ *of a farthing; and of ale* 5s. $10\frac{1}{4}$d. *and* $\frac{7}{11}$ *a farthing; and for small beer* 1s. $3\frac{1}{2}$d. *and* $\frac{3}{7}$ *of a farthing.*

How to gauge a copper, round tub, or cask.

If it be of equal bigness both at top and bottom, find the cubic inches that it contains, and then bring it into gallons, as before.

But if it be wider at the top than at the bottom, or the contrary, then take the width or diameter of the tub somewhat above the middle, next to the broadest end, if it be taper; or find the mean diameter thus: Suppose the bung diameter to be 26 inches, and the head diameter of the cask to be 23 inches, the difference between which is three inches, two thirds of which make two inches, which added to the lesser of the two diameters make 25 for the mean diameter sought. Having the mean diameter, proceed to find the contents in solid inches thus: first, square the mean diameter, multiply that square by 0,7854, and the product will give the content of the liquor at one inch deep: and this multiplied by the length, will give the solid inches in the copper, tub, or cask.

Example.

Suppose the mean diameter to be 72 inches, and the length 56 inches.

72
72
144
504
5184 square.
,7854
20736
25920
41472
36288
4071,5136 content at 1 inch deep.
56
24429081 6
203575680
228004,7616

The above found solid inches, 228004 brought into gallons, make 808, and 148 solid inches remain, something above half a gallon; in all 22 barrels, 16 gallons and $\frac{1}{2}$ of beer.

Again, admit the mean diameter of a cask of wine to be 14 inches, and the length 72 inches, what is the content in wine gallons?

14 | 0,7854
14 | 196
56 | 47124
14 | 70686
196 | 7854
153,9384
72
3078768
10775688
11083,5648

See the remainder of the operation in the following page.

231) 11083,5648 (47,9
924 · · ·

1843
1617 *Anſ.* 48 gallons nearly.

2265
2079

1866
&c.

The content of a ſpheroid may be found thus: Mu
tiply the ſquare of the ſhorteſt diameter by the long
diameter, and then divide by 538 for beer gallons, a
by 441 for wine gallons.

Example.

Suppoſe a ſpheroid whoſe ſhorteſt diameter is
inches, and the longeſt 125 inches; what is the conte
in beer and wine gallons?

74
74

296
518

5476 the ſquare of the ſhorteſt dia
125 the longeſt diameter.

27380
65712

538) 684500 (1272 gallons of beer.
538 ·

1465, *&c.*

(164)
441) 684500 (1552 gallons of wine.
441 ·

2435, *&c.*

(68)

To find the content of the fruſtum of a ſpheroid: to ice the ſquare of the bung diameter, add once the uare of the head, and multiply that ſum by the length? en for beer divide by 1077; and for wine gallons, ide by 882.

Example.

A caſk, whoſe bung diameter is 23 inches, head meter 21 inches, and length 27 inches; what is the tent in beer and wine gallons?

23	21
23	21
69	21
46	42
529	441

dd { 529, 529 } twice the ſquare of the bung diam.
{ 441 } once that of the head diameter.

1499
27 the length.

10493
2998

77) 40473 (37 beer gallons,
3231
8163
7539
(624)

882) 40473 (45 wine gallons,
3528
5193
4410
(783)

e Extraction of the Square and Cube Roots, of great Uſe in Meaſuring, Gauging, &c.

The Square Root.

A Square number ariſeth from the multiplication of a number into itſelf, the number ſo mul-lied being called the root; thus 4 multiplied by 4 duceth 16; ſo 16 is a ſquare number, and 4 is the

root thereof; ſo alſo 4 is the ſquare of 2, for twice 2 4, and 9 is the root of 81, for 9 times 9 is 81, &c.

2*dly*, To extract the ſquare root of any number, is t find another number, which multiplied by or into itſel produces the number given; and after the root is foun ſuch a multiplication is a proof of the work.

3*dly*, Square numbers are either ſingle or compoun

4*thly*, All the ſingle ſquare numbers, with their r ſpective roots, are contained in the following table, v

Roots.	1	2	3	4	5	6	7	8	9
Square.	1	4	9	16	25	36	49	64	81

5*thly*, When the ſquare root of any number leſs th 100 is required, and that number is not expreſſed in t table above; then you are to take the root of th ſquare number in the table, which (being leſs) com the neareſt to the given number. Thus if the ſqu root of 50 were required, then ſince 49 is the nea ſquare number in the table, therefore its root 7 will the root of the given number nearly.

6*thly*, A compound ſquare number, is that which produced by a number conſiſting of more places th one multiplied by itſelf, and is never leſs than 100; 729 is a compound ſquare number, produced by multiplying 27 into itſelf.

7*thly*, The root of any number under 100, may eaſily known by the foregoing table of ſingle ſquar but to extract the root of a compound number of veral places, obſerve the following directions:

Example 1.

Let the ſquare root of the number 45796 be requi

1. Set a point over the place of units, thus, 457 and ſo ſucceſſively over every ſecond figure towards left hand, as thus, 4579$^{\cdot}$6, and thus, 45796, but decimals you muſt point from the place of units tow the right hand, omitting one place, as above; and if places of decimals are odd, affix a cypher towards right hand of them to make them even. Your num thus prepared, draw a crooked line on the right of number, as in diviſion: and indeed the operation of ſquare root is not much unlike diviſion; only there diviſor is fixed, and in the ſquare root we are to fin new one for each operation. I ſay, having mad

croo

crooked line thus, 45796(ſeek in the foregoing table for the neareſt ſquare to the firſt point on the left hand, which here is 4, the root of which is 2, which root place on the right hand of the crooked line, and ſet its ſquare 4 under the ſaid point, as below:

```
45796 (2
4
-----
(0)
```

then ſubtract it, and there remains 0; to the remainder, bring down the next point 57 thus:

```
45796 (2
4
-----
057
```

which call the reſolvend; then double the root of the firſt point, and place it on the left hand of the reſolvend, thus:

```
45796 (2
4
-----
4)057
```

Call the 4, the double of the root 2, thus placed on the left hand of the crooked line, the diviſor; and ſeek how often 4, the diviſor, can be taken in 5, the firſt figure of the reſolvend 57, (for you are to omit the laſt figure towards the right hand) which here is once, place 1 to the right of the root 2, and alſo of the diviſor 4, thus:

```
45796 (21
4
-----
41) 057
```

Then multiply the diviſor (now 41) by the figure laſt placed in the root, *viz.* 1, place it under the reſolvend, and ſubtract it therefrom.

```
45796 (21
4
-----
41) 057
   41
-----
   16
```

Then bring down the next point. *viz.* 96, and place it on the right of the remainder 16, for a new reſolvend or dividend, thus: next double the quotient, or part of the root, *viz.* 21 and place it for a new diviſor to the new reſolvend 1696, thus:

```
45796 (21
4
41) 057
41
42) 1696
```

then ſeek how oft 42 in 169? (ſtill reſerving or omitting the unit figure of the reſolvend or dividend, as aforeſaid) and I find I can have it 4 times, which I place in the quotient and in the diviſor, and proceeding as before the work will appear thus:

```
45796 (214 root.
4
41) 057 reſolvend.
41
424) 1696 reſolvend.
1696 product.
(0)
```

In the laſt operation, I place 4 in the root, and likewiſe in the diviſor 42, which makes the new diviſor 424 to the reſolvend 1696; which diviſor multiplied by 4 the figure placed in the root, produces 1696; equal with the dividend or reſolvend aforeſaid, as in the operation may be ſeen. Therefore the ſquare root of 45796 is 214; for 214 multiplied into itſelf produces 45796 the number whoſe ſquare root was ſought.

Example 2.

What is the ſquare root of 12299049 (3507 the root

```
9
1ſt diviſor 65) 329 reſolvend.
325 product.
2d diviſor 700) 490 reſolvend.
000 product.
3d diviſor 7007) 49049 reſolvend.
49049
(0)
```

Example

Example 3. *performed decimally.*

160,000000 (12,679 root.

1

1st divisor 22) 060
44

2d divisor 246) 1600
1476

3d divisor 2524) 12400
10096

4th divisor 25289) 230400
227601

2799

Note, That when the divisor cannot be had in the resolvend, then place a cypher in the quotient, and also on the right of the divisor, and then bring down the next square, &c. as may be seen in the second example.

Note further, If any remainder happen to be after extraction, you may proceed by annexing pairs of cyphers to the left of the given number, and so come to what exactness you please.

Note also, Such numbers given for extraction that leave remainders, are by some called *irrationals*, because their roots cannot be exactly discovered, but still there will something remain, though you work by whole numbers or fractions; as in the example above, where the remainder is 2799.

The Extraction of the Cube Root.

TO extract the cube root of any number, is to find another number, which multiplied by itself, and that product by the number found, produces the number given for extraction.

All single cube numbers, with their respective roots, are contained in the following table:

Roots.	1	2	3	4	5	6	7	8	9
Cubes.	1	8	27	64	125	216	343	512	729

1*st*, To prepare any number for extraction, make a point over units, and so successively over every third figure toward the left hand, in integers, missing two between

tween each point; but in decimals you muſt point from the place of units to the right hand, *&c.*

Example.

Extract the cube root of 46656, prepared thus, as above directed.

46656

Here are but two points, therefore the root will have but two places.

2dly, The number being prepared, ſeek in the foregoing table the neareſt root to the firſt point or period 46, which you will find to be 3, which place in the quotient thus, 46656 (3, the cube whereof is 27, which place under your firſt period 46, as in the margin; ſubtract it from 46, and there reſts 19; this is your firſt work, and no more to be repeated. Then to the remainder 19, bring down the next period, *viz.* 6, 6, (which is the laſt) and place it on the right hand of the remainder 19.

```
46656 (3
27
-----
```

19656 reſolvend.

Then draw a line under the reſolvend; next ſquare the 3 placed in the quotient, which makes 9, which multiplied by 300 makes 2700 for a diviſor, which place accordingly, thus:

```
46656 (3
27
---------
2700)19656
```

Then ſeek how often 2 in 19? *Anſwer*, but 6 times, because of the increaſe that will come from the quotient, and place 6 in the quotient; then multiply the diviſor by 6, and the product will be 16200; which place orderly under the reſolvend, thus:

```
46656 (36
27
---------
19656
---------
16200
```

Then proceed to find the increaſe coming from the quotient, thus: Square your laſt figure 6, and it make

36

36; which multiplied by 3, the other figure of the quotient, it gives 108; which multiplied by 30, makes 3240. This place alſo orderly under the laſt number before ſet down, *viz.* 16200, and the work will appear thus:

```
46656 (36
27
---
2700) 19656
      -----
      16200
       3240
```

Then cube the figure laſt placed in the quotient, viz. 6, and it makes 216; which place orderly likewiſe under the line 3240; add the three lines together, and they make 19656, which is equal to the reſolvend above, viz. 19656; and there being no more periods to bring down, I ſee the work is finiſhed, and find the cube root of 46656 to be 36.

This will appear to be true, if the root 36 be multiplied by 36, and that product by 36 again, for then the reſult will be 46656, as in the following operation:

```
  36
  36
 ---
 216
108
----
1296
  36
-----
7776
3888
-----
46656 proof.
```

Some uſes of the Square and Cube Roots.

1. *To find a mean proportional between two numbers.*

Rule. The ſquare root of the product of the given numbers is the mean proportional ſought; ſo the mean proportional between 16 and 64 will be 32, for 16 multiplied by 64 produces 1024, and the ſquare of 32 is alſo 1024. This is of uſe in finding the ſide of a ſquare equal to any parallelogram, rhombus, rhomboides, triangle, or regular polygon.

2. *To find the ſide of a ſquare equal to the area of a given ſuperficies.*

Rule. The ſquare root of the content of any given ſuperficies is the ſide of the ſquare. So if the content of a given circle be 160, the ſide of the ſquare equal will be 12,649.

3. *The area of a circle being given, to find the circumference.* See page 210.

4. *The area of a circle being given, to find the diameter.* See p. 209.

5. *Any two ſides of a right-angled triangle being given, to find the third ſide.*

This depends upon a mathematical propoſition, in which it is proved, that the ſquare of the hypothenuſe, or longeſt ſide of a right angled triangle, is equal to the ſum of the ſquares of the baſe and perpendicular, that is, of the other two ſides.

See Figure 13.

Caſe 1. Let the baſe or ground AB repreſent the breadth of a moat or ditch, and the perpendicular BC the height of a caſtle, tower, or city-wall; and the hypothenuſe AC, the length of a ſcaling-ladder.

In this figure, the baſe AB is ſuppoſed to contain 40 yards; and the perpendicular or height of the tower or wall, 30 yards; what length will the hypothenuſe AC, or the ſcaling-ladder be?

Rule. The ſquare root of the ſum of the ſquares of the baſe and perpendicular, is the length of the hypothenuſe. *See the work.*

1600 the ſquare of the baſe 40.
900 the ſquare of the perpendicular 30.

The ſum 2500 (50 yards the root or length of the
25 ſcaling-ladder.

(o)

Caſe 2. If the length of the baſe, or breadth of the ditch were required; then the ſquare root of the difference of the ſquares of the hypothenuſe and perpendicular is the length of the baſe, or breadth of the ditch or moat. *See the work.*

2500

2500 the ſquare of the hypothenuſe, AC.
900 the ſquare of the perpendicular, BC.

The diff. 1600 (40 yards the root or breadth of the ditch;
16

(0)

Caſe 3. If the height of the tower or perpendicular BC were required, then the ſquare root of the difference of the ſquares of the hypothenuſe and baſe, is the height of the perpendicular BC.

6. *Any number of men being given to be formed into a ſquare battalia, to find the number of rank and file.*

Rule. The ſquare root of the number of men given, will be the number of men to be placed in rank and file.

Example. Admit an army of 32,400 men were to be formed into a ſquare battalia; the ſquare root of 32,400 will be found to be 180; and ſo many men muſt be placed in rank, and alſo in file.

7. *To find the ſide of a ſquare, polygon, or the diameter of a circle, which ſhall be to any other given ſquare, ſimilar polygon, or circle, in a given proportion.*

Rule. Since like ſurfaces are to each other, in a duplicate proportion of their like ſides; therefore,

As the given circle, ſquare, or polygon,
Is to the required circle, ſquare, or polygon;
So is the ſquare of the diameter, or ſide of the firſt,
To the ſquare of the diameter, or ſide of the ſecond.

Then the ſquare root of the reſult of the above proportion will be the diameter or ſide required.

Example 1. There is a circle whoſe diameter is 11; what will the diameter of that circle be, whoſe area is four times the area thereof?

Here 11 times 11 is 121; and

As 1 —— 4 :: —— 121
4

484 (22 the anſwer.
4

42) 84
84

Example.

Example 2. There are two similar polygons, whose areas are as 9 to 25, and the side of the leſſer is 12 yards; what is the ſide of the greater? Here 12 times 12 is 144; and

As 9 — 25 — 144

25

720

288

9)3600

400 (20 the anſwer.

4

(000)

8 *The uſes of the cube root are to find the dimenſions of like ſolids, as globes, cylinders, cubes,* &c.

Rule. Since like ſolids are to each other, as the cubes of their like ſides or diameters; therefore,

As the content or weight of a given ſolid,
To the content or weight of another like ſolid;
So is the cube of the ſide or diameter of the one,
To the cube of the ſide or diameter of the other.

Then the cube root of the reſult will be the length of the ſide or diameter required.

Example 1.

If a bullet that weighs 72 *lb.* is 8 inches in diameter, what will be the diameter of that bullet that weighs 9 *lb?*

Here the cube of 8 is 512; and

As 72 — 9 — 512

9

72) 4608 (64

432

288

288

Then the cube root of 64, *viz.* 4, is the diameter required.

Example 2.

If a ſhip of 100 tons be 44 feet long at the keel, what length muſt the keel of a ſhip be that carries 200 tons?

Say, as 100 is to 220, ſo is the cube of 44, *viz.* 58164 to 187404,8; whoſe cube root is 57,226, the length of the keel ſought.

Example 3.

There is a cubical veſſel, whoſe ſide is 12 inches, and it is required to find the ſide of a veſſel that holds three times as much. Here the cube of 12 is 1728, which multiplied by ——— 3

produces ——— 5184

the cube root of which is 17,386, the anſwer required, or ſide ſought.

An eaſy rule to find the length of a maſt of a ſhip, viz.

Two thirds the length of the keel, and the breadth of the beam is the length of the main-maſt; and the rule is therefore, to multiply the length of the keel by 2, and to divide the product by 3, and then to the quotient add the breadth of the beam, and the total is the length of the main-maſt.

Example.

Suppoſe a ſhip to be 108 feet by the keel, and 40 feet by the beam, what is the length of the main-maſt?

108
2

3) 216

Add { 72 two thirds of the keel.
40 the breadth of the beam.

112

Anſ. The length of the main-maſt is 112 feet, as in the work.

Again,

Admit a ſhip to be 84 feet by the keel, and 31 feet by the beam, what is the length of her main-maſt?

84 *per* keel.
2

3) 168

Add { 56 two thirds of the keel.
31 the breadth of the beam.

Anſ. 87 feet, the length of the main-maſt.

Another way to find the length and thickneſs of maſts a yards, viz.

The way to find the length of the main-maſt is t add the breadth of the beam, and the depth of the hol in feet together, and divide the total by 1,5, and th quotient will be the length of the main-maſt in yards,

Example.

Admit a ſhip whoſe keel in length is 73 feet, and th breadth of the beam 28,5 feet, and the depth of th hold 12 feet; what is the length of the main-maſt?

Feet.
28,5 breadth of the beam.
12,0 depth of the hold.

1,5) 40,5 (27 yards, *Anſ.*
30
105
105
(0)

Anſ. 27 yards, or 81 feet, as *per* work.

To find the thickneſs of the maſt, having the length ſay, by the rule of proportion, (or rule of three,) if 8 feet long require 28 inches thick, what will 81 feet long as in the following work:

F. L. *In. thick.* *F. L.*
If 84 —— 28 —— 81
81
28
224
84) 2268 (27 inches thick, *Anſ.*
168
588
588
(0)

The Conſtruction of ſome uſeful Geometrical Problems.

1. *At a given point near the middle of a right line given, to erect a perpendicular.* See figure 14.

LET CD be the line given, to have a perpendicular erected on it from the point B; with the compaſſes opened at a convenient diſtance, place one foot at the point B, and with the other make the two marks E and F, on either ſide of B; then, having the ſame, or any other more convenient diſtance in the compaſſes, ſet one point on E, and with the other deſcribe the arc G G; which being done, without altering the diſtance laſt uſed, ſet one foot, at F, and with the other deſcribe the arc H H, croſſing the former at the point A; through which interſection with a ruler draw a line from A to B, which will be perpendicular to the line CD.

2. *How to raiſe a perpendicular at or near the end of a line.* This is effected ſeveral ways; but I ſhall inſtance only two, which are very eaſy. *See figure* 15.

Firſt method.

Suppoſe the line A B be given to raiſe a perpendicular near the end A.

Firſt, Open your compaſſes to any convenient diſtance, and ſet one foot on the point A, and with the other deſcribe the arch FED; then, with one foot of the compaſſes in D, (they retaining the ſame diſtance) croſs the arc in E; and then ſetting one foot in E, with the other make the arc AFG, croſſing the firſt arc in F. Again, ſet one foot in F, and with the other deſcribe the ſmall arc HH, croſſing the former in the point C: ſo the line AC being drawn, will be the perpendicular required.

The ſecond method.

Admit B be the point given, on which to draw the perpendicular BI. Open the compaſſes to any convenient diſtance; and ſetting one foot on the point B, pitch down the other foot at random, as ſuppoſe at K; then the foot reſting in K, turn the other about till it croſs the line AB in L; then draw the line KL, and continue the ſame beyond K, ſetting off the ſame diſtance KL (at which the compaſſes already ſtand) from K to M; ſo a line drawn from B through M, will be the perpendicular required.

3. *How to divide a right line into two equal parts.* See figure 16.

Suppoſe the line AB be given to be divided into two equal parts. Take in the compaſſes any diſtance above half the length of AB. and ſetting one foot on the point A, with the other draw the arc FDE; then (with the compaſſes unaltered) ſet one foot in B, and with the other croſs the former arc both above and below the line, in the points F and G; then a line drawn from F to G ſhall interſect, or cut the given line in H, and divide the line AB into equal parts, AH and HB.

4. *A line being given, how to draw another line parallel thereunto, at any diſtance required, or through any point aſſigned.*

Of parallel lines there are two ſorts, viz. *ſtraight*, and *circular*. All circles drawn on the ſame centre, whether greater or leſſer one than the other, are ſaid to be parallel or concentric, that is, having one common centre. *See figure* 17.

In this figure, the circle ABCD is concentric, or parallel to the circle EFGH, becauſe both of them are drawn from the ſame centre. The line AC is the diameter of the greater circle, and the line EG of the leſſer circle. And all right lines drawn from the centre to either of the circumferences, are equal with reſpect to their periphery; and ſuch lines are called half-diameters, and ſometimes the radius of the circle, and will divide the circle into equal parts, each containing 60 degrees, and the whole circle 360; into which all the great circles of the ſphere are ſuppoſed to be divided.

Of parallel right lines.

Right lined parallels are lines drawn on a plane of equal length and diſtance; and though infinitely extended will never meet, and in all parts retain an equal diſtance; ſuch as theſe underneath:

B———— ————C

C———————————D

To draw a right line parallel to another right line at a diſtance given. See figure 18.

Take in your compaſſes the given diſtance GH, then ſetting one foot in E, draw the arc IK, then moving to F, deſcribe the arc LM; then laying a ruler on the top of the two arcs, juſt touching them, draw the line NO, which will be parallel to the given line EF.

5. *Throu*

5. Through any three points (not in a ſtraight line) to deſcribe a circle. See figure 19.

Let the three points given be A, B, and C, through which it is required that a circle be drawn. Firſt, ſet one foot of the compaſſes in one of the given points, as ſuppoſe in A, and extend the other foot to B, another of the points, and draw the arc of a circle G F D; then the compaſſes not altered, ſet one foot in B, and with the other croſs the ſaid arc with two ſmall arcs, in the points D and E; and draw the line D E. Thirdly, ſet one foot in C, (the compaſſes being at the ſame diſtance) and with the other foot croſs the firſt arc G F D in the points of F and G, and draw the line F G, croſſing the line D E in the point O, which is the centre ſought for: in which place one foot of the compaſſes, and deſcribe the circle at the diſtance O A, and it will paſs through all the given points, A, B, and C.

How to make a line of chords geometrically to any aſſigned length or radius.

Since in the art of Dialling, there is frequent uſe made of the line of chords, it is proper here to ſhew the making thereof.

A line of chords is 90 degrees of the arc of a circle tranſferred from the limb of the circle to a ſtraight line; now every circle, whether great or ſmall, is divided (or ſuppoſed ſo to be) into 360 equal parts, called degrees: ſo the ſemi or half circle contains 180, the quadrant or quarter 90, and the radius or ſemidiameter (which is that line with which the circle or ſemicircle is drawn or deſcribed) is always equal to 60 degrees of that circle which it deſcribes, and therefore 60 degrees of a line of chords is called the radius thereof.

To make a line of chords; as in figure 20.

Firſt, draw a line of any length, as C B D, and on the middle thereof erect the perpendicular A B. Next, open your compaſſes to the radius or length that you would have your line of chords be of; which admit A B, and with that diſtance on B as the centre, deſcribe or draw the ſemicircle C A D, which is divided into two equal parts or quadrants by the perpendicular line A B. Thirdly, divide the arc or quadrant A D, into 90 equal parts or degrees; which is done by taking the length of the line A B, and ſetting that diſtance on the quadrant A D, and from D to R; ſo is D R 60 degrees, and A R

30 degrees; then take the diſtance A R, and ſet it fro
D to S, ſo is the quadrant divided into 3 equal parts,
the points S and R, each containing 30 degrees: Th
done, divide the ſeveral ſpaces between A R, R S, a
SD, into three equal parts, each of which will be
degrees, according as the numbers are ſeen and ſet apa
to them; and theſe again divided into two equal part
each part contains five degrees; and every one of tho
into five ſmaller, as in the repreſentation; and ſo t
whole quadrant is divided into 90 degrees Fourthl
the quadrant A R S D being thus divided into 90 degre
ſet one foot of the compaſſes in D, and open the foot
deſcribe the arc A E F, touching the line C D in F,
is the point F, upon the right line C D, the chord of
degrees. Fifthly, open the compaſſes from D to 80 d
grees, and deſcribe the arc 80 G H; ſo ſhall the poi
H be the chord of 80 degrees. Sixthly, open the co
paſſes from D to 70, deſcribe the arc 70 I K, ſo is K t
chord of 70 degrees. Again, open the compaſſes fro
D to R, the radius, or 60 degrees, and deſcribe the a
R L B, ſo is B the chord of 60 degrees equal to t
radius. Do the ſame by 50, 40, 30, 20, and 10, a
then you will have the line D F divided into 90 unequ
parts, called chords, as in figure 20.

Thus much for the line of chords frequently made u
of in Dialling, where there is not the conveniency
having a mathematical inſtrument-maker near at hand

Note, *A degree is the* 360*th part of the globe, or of a*
circle; each of which degrees is ſuppoſed to be divided into
parts, called minutes; ſo that 45 *minutes is three quarte*
of a degree, and 30 *minutes half a degree, and* 15 *minu*
one quarter of a degree.

Inſtrumental Arithmetic.

AS problems or queſtions in meaſurement, &c. a
ſolved or anſwered arithmetically by the pen, ſo a
they alſo inſtrumentally taken by compaſſes from certa
lines, &c. or rules made for that purpoſe, for the help
thoſe that are deficient in arithmetic, or for a quick
diſpatch of buſineſs; and ſuch performances are call
inſtrumental arithmetic; and of theſe inſtruments, the m
in vogue or uſe are theſe three: 1. The carpenter's pla
rule: 2. Gunter's line; 3. Coggleſhal's ſliding rule.

1. T

1. *The Carpenter's Plain Rule.*

This rule is made use of in measuring boards and timber, being two feet in length, and divided into twenty-four parts or inches, and every one of those parts or inches, subdivided into half inches, and each of those halves into quarters, and each quarter into two parts; so that every inch is divided into eight parts, and the whole length into 192 parts.

This rule is well known, and therefore not absolutely necessary of representation; but however, for the better understanding it, I shall give one, thus:

Under broad measure thus described:

1	2	3	4	5	6	1	7	
2	0	4	3	2	2			
0	0	0	0	4	6			

The line begins at 6, and goes on to 36, within 4 inches of the rule on the right hand.

In. deep.	*Feet.*	*In.*	*pts.*	
1	12	0	0	
2	6	0	0	
3	4	0	0	in length make
4	3	0	0	a foot square.
5	2	4	9	
6	2	0	0	

If a board be

By this table it is manifest, and easily understood, that a board of four inches requires 3 feet in length to make a foot square, and a piece of 3 inches broad will require 4 feet in length to make a foot square, *&c.*

At the other end of this rule is a table called *Under Timber Measure;* and thus described:

1	2	3	4	5	6	7	8	
144	36	16	9	5	4	2	2	
0	0	0	0	9	0	11	3	

This line begins at eight and a half, and goes on (by division) to 36.

In square.	*Feet.*	
1	144, 0	
2	36, 0	
3	16, 0	
4	9, 0	in length make
5	5, 9	a solid foot.
6	4, 0	
7	2, 11	
8	2, 3	

If a piece of timber of

By this table it is plain, that if a piece of timber is 6 inches square, then 4 feet in length of that piece will make a solid foot.

It

It is a common method with carpenters to add the breadth and thickneſs of a piece of timber in inches together, and call the half thereof the ſide of the ſquare of that piece; but this method gives the content more than it is; and the greater the difference, the larger the error. But the true ſquare may be found in Gunter's line, thus: Place one point of the compaſſes upon the line at the thickneſs, and the other at the breadth, then half of that extent will reach from either the breadth or thickneſs to the ſide of the true ſquare in inches.

2. *Gunter's Line.*

This line is commonly ſet on the Carpenter's plain rule, and conſiſts of two lines numbered, 1, 2, 3, &c. one ſet at the end of the other, and it is ſomewhat of the following form:



G's. Line. To prove the line by the compaſſes, obſerve,

the diſtance from	1 to 2 5 to 10 4 to 8	is equal to the diſtance from	2 to 4 4 to 8 3 to 6	&c.

To number on Gunter's Line.

Obſerve, that the figures 1, 2, 3, 4, 5, 6, 7, 8, 9, ſometimes ſignify themſelves ſimple or alone; at other times, 10, 20, 30, 40, &c. Again, at other times, 100, 200, 300, or 1000, &c.

To find a number on the line, ſuppoſe 134.

For the figure 1 account 1 on the line; and for 3 take 3 of the large diviſions; and for 4 take 4 of the ſmaller diviſions; and that is the point. Again, to find 750 on the line; for 7 take 7 on the line; for 50, take 5 of the great diviſions; and that is the point.

To find a ſmall number on the line, ſuppoſe 12.

For 10 take 1, as before, and for 2 take 2 of the large diviſions, and that is the point.

In meaſuring boards or timber, it is beſt to have a line of 2 feet long, and compaſſes 1 foot long.

Note, *Let the meaſurement be by the inch, foot, yard, pole, rod,* &c. *it is beſt to have it decimally divided, or ſo ſuppoſed, that is, into* 10*th, parts,*

Note

Note alſo, *That if one point of the compaſſes reach beyond the line in the work, remove the other point to the ſame figure or place on the other line.*

Multiplication by Gunter's Line.

To multiply 5 by 7, ſet one foot of the compaſſes on 1 in the left-hand line, and extend the other to 5 upwards, or towards the right-hand, and with the ſame extent place one foot in 7, and the other foot will fall on 35, in the right hand line, which is the anſwer.

Diviſion by Gunter's Line.

Example 1. Divide 63 by 3; extend from 3 to 1 downwards, or towards the left hand, and the extent will reach the ſame way from 63 to 21 the quotient.

N. B. *In multiplying you muſt always extend upwards, that is, from 1 to 2, 3, 4, &c. and, on the contrary, in dividing extend downwards.*

Example 2. Divide 288*l.* equally among 16 men: Extend from 16 to 1 downwards; and the extent will reach the ſame way, from 288*l.* to 18*l.* for each man. Again, *Ex.* 3. Suppoſe 750*l.* were to be divided among 25 men; extend from 25 to 1 downwards; and that extent will reach the ſame way, from 750*l.* to 30*l.* each man's ſhare.

Rule of Three Direct.

Example 1. If 5 buſhels of barley coſt 11 ſhillings what will 40 buſhels coſt? Extend from 5 to 11 upwards; and that extent will reach, the ſame way, from 40 to 88, the ſhillings required.

Example 2. If three ells of holland coſt 10*s.* 6*d.* what will 40 ells coſt? Extend from 3 to 10½ upwards; and that extent, the ſame way, will reach from 40 to 140*s.* the anſwer.

The Uſe in Board Meaſure.

Example. If a board be 9 inches broad, and 19 feet long, what is the content in ſuperficial ſquare feet? Extend from 12 (the centre of feet meaſure) to 9 downwards; and that extent, the ſame way, will reach from 19 to 14 and ¼.

In Timber Meaſure.

Example. A piece of timber 24 inches ſquare, and 8 feet long, what is the content in ſolid feet? Extend from 12 the centre to 24 upwards; and that extent twice the ſame way, will reach from 8 to 32 feet the content.

Brick

Brick Work.

How many rods of work are there in 4085 feet? Extended from 272 downward to 2; and that extent, the ſame way, from 4085, will reach to 15 rods, the anſwer.

3. *Coggleſhal's Sliding Rule.*

The next inſtrument I ſhall ſpeak of, is that which goes by the name of *Coggleſhal's Sliding Rule.* And firſt,

Its deſcription.

This rule is framed three ways; ſliding by one another as the glaſier's rule; ſliding on one ſide of a two-feet joint rule; and one part ſliding on the other in a foot of length; the back part being flat, on which are ſundry lines and ſcales.

Upon the aforeſaid ſliding ſide of the rule, are four lines of numbers, three are double lines, and one a ſingle line of numbers marked with ABC and D; the three marked AB and C, are called double lines of numbers, and figured 1,2,3,4,5,6,7,8,9. Then 1,2,3,4,5,6,7,8,9, and 10 at the end. That marked D; is the ſingle line of numbers, figured 4,5,6,7,8,9,10,20,30, and at the end 40, even with and under 10, in the double line next to it, which is called the girt line, and ſo marked in the figure.

The figures on the three double lines of numbers, may be increaſed or decreaſed at pleaſure; thus 1 at the beginning may be called 10, 100, or 1000; the 2 is 20, 200, or 2000; ſo that when 1 at the beginning is 10, the one in the middle is 100, and 10 at the end is 1000; but if one at the beginning is counted for 1, then 1 in the middle is 10, and 10 at the end is 100.

And as the figures are altered, ſo muſt the ſtrokes or diviſions between them be altered in their value, according to the number of the parts they are divided into; as thus, from 1 to 2, it is divided into ten parts, and each tenth is divided into 5 parts; and from 2 to 3, it is divided into 10 parts, and each tenth into two parts, and ſo on from 3 to 5, then from 5 to 6, it is divided into 10 parts only; and ſo on unto 1 in the middle of the rule, or the end of the firſt part of the double line of numbers. The ſecond part of the double line is divided like the firſt.

The girt line marked D, is divided from 4 to 5 into 10 parts, and each tenth into two parts, and ſo on from 5 to 10; and then from 10 to 20, it is divided into 10 parts,

parts, and each tenth into 4 parts; and ſo on all the way from 20 to 40 at the end, which is right againſt 10 at the end of the double lines of numbers.

The lines on the back ſide of this rule that ſlides on one ſide, are theſe, *viz.* a line of the inch-meaſure, from 1 to 12, each divided into halves, quarters, and half quarters; another line of inch-meaſure from 1 to 12, each divided into 12 equal parts, and a line of foot-meaſure, being one foot divided into 100 equal parts, figured 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100, even with 12 on inch-meaſure.

And the back ſide of the ſliding piece is divided into inches, halves, quarters, and half-quarters, and figured from 12 to 24, ſo that it may ſlide out to 2 feet, to meaſure the length of a tree or any thing elſe you have occaſion to meaſure.

The uſe of the Double Scale.

Examples.

Suppoſe there is a geometrical ſquare, whoſe ſides are $3\frac{1}{2}$ feet each; Set one foot on the line B, to $3\frac{1}{2}$ on the line A; and then againſt $3\frac{1}{2}$ on the line B, is $12\frac{1}{4}$ feet on the line A, which is the content of ſuch a ſquare.

F.	*Pts.*	
3	6	
3	6	
10	6	arithmetically.
1	9	
12	3	Proof.

Suppoſe the ſide of rhombus to be 8 feet $6\frac{1}{4}$ inches, and the breadth or line A, B, 4 F. $4\frac{1}{2}$, what is the content? Set one foot on the line B, to $8\frac{52}{100}$ feet on the line A, then againſt $8\frac{52}{100}$ feet on the line B, is 71 feet $\frac{40}{100}$ parts of a foot on the line A; and to know the value of the decimal, or part of the foot, look for $\frac{40}{100}$ on the rule, and you will find againſt it $4\frac{1}{2}$ inches.

Again, Suppoſe the length of a rhomboides, to be 17 f. 3, or $17\frac{25}{100}$, and the breadth 8 f. 7 or $8\frac{58}{100}$, what is the content? Set one foot on the line B, to 17,25 on the line A, then againſt 8,58 on the line B, is 148 feet on the line A. The figure hath been repreſented before, and operated arithmetically, therefore it is here unneceſſary.

Let

Let the baſe of a triangle be 4 feet 1½ inch, and th perpendicular 2 feet 1½: the half of the one is 2 fe 7 parts; and of the other 1 foot 7 parts. Set one o the line B, to 4,15 on the line A; then againſt 1,07 half the perpendicular on the line B, is 4 feet, and a moſt ¼ a foot for the content. Or, if you ſet 1 on th line B, to 1,07 on the line A, againſt 4,15 on the lin B, is 4, and almoſt ¼ a foot on the line A.

Again, another way. If you ſet 1 on the line B, t 4,1 on the line A, then againſt 2,15 on the line B 8$\frac{8}{10}$ feet (which is about 11 inches) on the line A, th half whereof is 4 feet 5$\frac{4}{7}$ inches, which is the content o the triangle.

GEOGRAPHY.

GEOGRAPHY is the art of deſcribing the figur magnitude, and poſition of the ſurface of th earth and ſeas, and their parts.

Many and ſufficient arguments may be produced t prove, that the earth and ſeas are of a ſpherical or globu lar figure; one of them may be ſufficient in this plac *viz.* that ſhips in ſailing from high capes or headland loſe ſight of their lower parts firſt; and continue gradu ally to loſe ſight of thoſe which are ſituated higher an higher, till at laſt the top vaniſhes; which could not b unleſs the ſurface of the ſea were convex: now this con vexity of the ſea is found to be uniform in all par thereof, therefore the ſurface of the water is ſpherical which being granted, that of the land muſt be nearly ſ becauſe its extremities ſets limits to the waters.

The whole body of the earth and ſea is therefo called the *Terraqueous Globe.*

Since, as has been obſerved, all circles are divided i to 360 degrees, therefore any great circle ſurroundi the terraqueous globe, is uſually ſo divided. Our i genious countryman, Mr *Richard Norwood*, about th year 1635, by an accurate meaſurement of the diſtan between *London* and *York*, found that a degree of a gre circle was about 69½ ſtatute miles in length, and conſ quently that the circumference of the terraqueous glob was 25020 miles; whence its diameter will be 79 miles.

Th

The ſea covers the greater part of the terraque us globe, out of which the land riſes with very ſlow aſcents, the height of the loftieſt mountains thereof being hardly the four-thouſandth part of the above-found diameter, which is but juſt ſufficient to give the rivers a flow and eaſy deſcent.

Geographers have found it neceſſary to imagine certain circles to be drawn on the ſurface of the earth, for the better determination of the poſition of places thereon.

Theſe are either greater or leſſer circles; great circles divide the globe into two equal parts, and leſſer circles divide it into two unequal parts.

There are ſix kinds of great circles; two of them, *viz.* the equator, or equinoctial, and the ecliptic are fixed; but the other, *viz.* the meridians, the circles of longitude, the horizons, and the vertical circles, are variable, according to the part of the globe they are appropriated to

There are two points on the ſurface of the terraqueous globe, called the *Poles of the earth*, which are diametrically oppoſite to each other; the one is called the *North*, and the other the *South Pole*.

The equator is that great circle which is equally diſtant from the above-mentioned poles, and is ſo called from its dividing the terraqueous globe into two equal parts; named from the poles which are ſituated in each, the northern and ſouthern hemiſpheres: it is alſo called equinoctial, becauſe, when the ſun enters it, the days and nights are of equal length in all parts of the globe: ſeamen commonly call this circle *the Line*.

Meridians, or circles of terreſtrial longitude, are ſuppoſed to be drawn perpendicular to the equator, and to paſs through the poles; they are called meridian or mid-day circles, becauſe when the ſun comes to the meridian of any place, it is noon or mid-day at that place.

Hence every particular place on the ſurface of the terraqueous globe hath its proper meridian, and conſequently a traveller, who doth not directly approach to, or recede from, one of the poles, is continually changing his meridian.

With reſpect to the two circles above deſcribed, every place upon the earth is ſaid to have its particular latitude and longitude.

The latitude of any place upon earth is its diſtan from the equator, in a direct line towards one of th poles; and ſince the meridians proceed in ſuch dire lines, therefore latitude is reckoned in degrees, an parts of degrees, on the meridian of the place.

The longitude of any place upon earth is the eaſt weſt diſtance of the meridian of that place, from ſom fixed meridian, at which longitude is ſuppoſed to begin now, ſince all the meridians paſs through the poles; the coincide with one another at thoſe points, and the greateſt diſtance from each other will be, when they a fartheſt from thoſe points of coincidence, *viz.* at th equator, therefore longitude is reckoned in degrees, an parts of a degree, on the equator.

Geographers have differed very much in the meridia from whence they have aſſumed the beginning of a longi tude; the ancients choſe the meridian of the Canarie which they called the *Fortunate Iſlands*; others hav pitched on the iſlands of Azores, or the Weſtern Iſland but the moſt uſual way now is to reckon longitude fro the capital of that country in which an author writes and accordingly the longitude is hereafter reckoned fro the meridian of London.

Parallels of latitude are ſmall circles drawn parallel t the equator of any aſſigned diſtance therefrom; there fore every particular place on the ſurface of the ter raqueous globe hath its proper parallel of latitude.

There are four of theſe parallels of latitude, that ar particularly remarkable, *viz.* the two tropics, and the tw polar circles; but for the better explanation of thei properties, it will be neceſſary, firſt to define the ecliptic

The ecliptic is that great circle in which the ſun ſeem to perform its annual motion round the earth; this circl makes an angle with the equator of 23° 29′: it interſect it in two oppoſite points, called the *equinoctial points:* an thoſe two points in the ecliptic which are fartheſt fro the equinoctial points are called the *ſolſticial points.*

The tropic of Cancer is a parallel of latitude 23° 29 diſtant from the equator in the northern hemiſphere, paſſ ing through the northern ſolſticial point of the eclipti above deſcribed: And

The tropic of Capricorn is a parallel of latitude, as fa diſtant in the ſouthern hemiſphere, paſſing through th ſouthern ſolſtitial point.

Th

The artic polar circle is a parallel of latitude 23° 29′ diſtant from the north pole; and the antartic polar circle is a parallel of latitude as far diſtant from the ſouth pole.

The tropics and polar circles divide the globe into five parts, called Zones, that is to ſay, girdles or belts; one of them is called the Torrid, two Temperate, and two Frigid.

The torrid zone, ſo called from the great heat of the ſun (which is vertical, or paſſes directly over the heads of the inhabitants twice in a year) is ſituated between the two tropics, and is therefore about 47 degrees in breadth: the inhabitants are called *Amphiſcians*, that is, ſuch as have their ſhadows caſt both ways, the ſun being at noon ſometimes to the north, and at other times to the ſouth of them.

The northern temperate zone is ſituated between the tropic of Cancer and the artic polar circle; and the ſouthern temperate zone, between the tropic of Capricorn and the antarctic polar circle: They are each of them about 43 degrees broad; the inhabitants are called *Heteroſcians*, that is, ſuch as have their ſhadow but one way; for at noon the ſhadows of the inhabitants of the northern temperate zone, are always caſt northward; and thoſe of the inhabitants of the ſouthern, ſouthward.

The frigid zones contain all that ſpace between the polar circles and the poles themſelves; the northern frigid zone, being ſurrounded by the arctic circle, and the ſouthern by the antarctic; the inhabitants are called *Periſcians*, becauſe (when the ſun is on the ſame ſide of the equator as thoſe inhabitants are) their ſhadows are, in the ſpace of 24 hours, caſt off all ſides, or quite round them. The ſun does not ſet in the place within theſe zones, during ſeveral ſucceſſive revolutions or days in the ſummer; and in the winter he doth not riſe for the like ſpace of time. At the poles themſelves the ſun is viſible for half of the year, and inviſible for the other half.

If any place on the globe (except the poles and equator) be particularly conſidered, there will be three other places on the ſame meridian, which have more immediately a relation thereto, *viz.* 1. That place which has the ſame latitude on the other ſide of the equator; the inhabitants of this place are called *Antæci* or *Antæcians*; they have mid-day and mid-night, at the ſame

times with thoſe of the place aſſumed, but the ſeaſon of the year are different, the ſummer of the one being the winter of the other.

2. That place which is on the ſame parallel of latitude but is 180 degrees different in longitude; the inhabitant of this place are called *Periæci* or *Periæcians*; they hav ſummer and winter at the ſame times with thoſe of th places aſſumed, but the times of the day are different the mid-day of the one being the mid-night of the other

3. That place which has the ſame latitude on th other ſide of the equator, and is 180 degrees differen in longitude; this place is diametrically oppoſite to th place aſſumed: Its inhabitants are called *Antipodes*, an their ſeaſons of the year, as well as times of the day, ar totally oppoſites.

The horizon is that great circle which divides the up per or viſible hemiſphere of the world, from the lower o inviſible; the eye of the ſpectator being always in th center of his horizon. Hence every particular place o the terraqueous globe hath a different horizon; and con ſequently a traveller proceeding in any direction, is conti nually changing his horizon.

The circle is by mariners divided into four quarter containing 90 degrees; the four points quartering th circle are called cardinal points, and are named Eaſ Weſt, North, and South: The eaſt and weſt are thoſ points on which the ſun riſes and ſets when he is in th equinoctial; and the north and ſouth points are thoſ which coincide with the meridian of the place, and ar directed towards the north and ſouth poles of the world

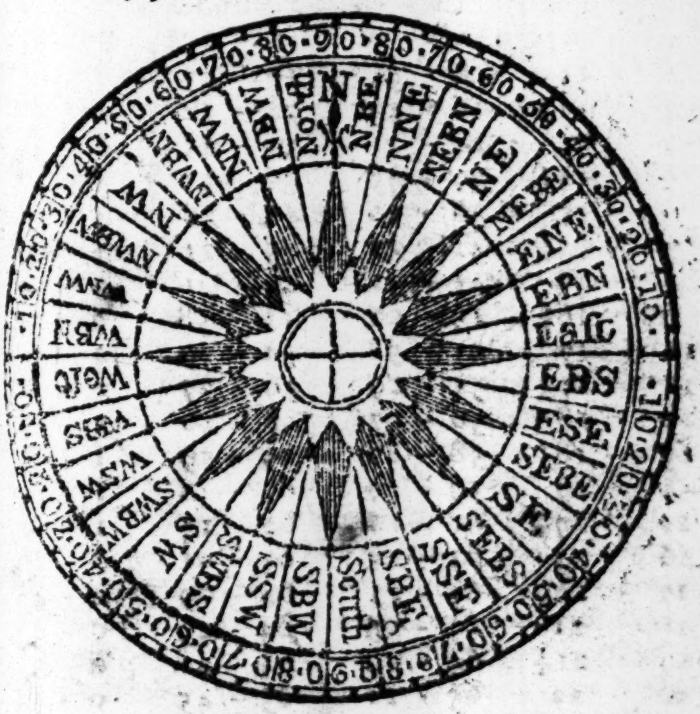
Each quarter of the horizon is farther divided int eight points, which are very neceſſary to the geographe for the diſtinguiſhing the limits of countries; but th uſe of theſe diviſions is much more conſiderable, whe applied to the mariner's compaſs.

Before the invention of this moſt excellent and uſefu inſtrument it was uſual in long voyages to ſail by, o keep along the coaſt, or at leaſt to have it in ſight; t is manifeſt and plainly evident, from the voyages of S Paul, Acts xx. 13. and xxvii 2. which made their voy ages long and very dangerous, by being ſo near th ſhore. But now, by the help of a needle, touched b the magnet or loadſtone, which by a wonderful and hid den quality, inclines its point always northerly, the in

genio

genious mariner is directed in his proper course of sailing through the vast ocean, and unfathomable depths, to his intended port: and, if the wind is favourable, can sail near 333 leagues, or 1000 miles, in a week, though in the darkest weather, or darkest night, when neither sun, moon, nor stars, are to be seen; which before were the only guide; and, if not seen, the sailors were at a great loss, and exposed to the most imminent danger.

The Compass, with the Cardinal and other Points.



The above compass is a representation of the horizon on a circular piece of paper called a *card;* which card being properly fixed to a piece of steel called the needle, and placed so as to turn freely round a pin that supports it, will shew the position of the meridian and other points, and consequently towards which of them the ship sails.

Note, The letters *NBE, NNE, NEBN,* &c. are to be read, North by East, North North East, North East by North, &c.

A climate is a space of the terraqueous globe contained between two such parallels of latitude, that the length

of the longeſt day in the one exceeds that in the other b half an hour.

There are 60 climates, 30 north, and 30 ſouth of th equator; 24 of each 30 being ſituate between the equato and the polar circles, differ in the length of their longe day by 24 hours; but in the remaining 6 between th polar circles and poles, the differences of the lengths o the longeſt days are each a month.

Table of Climates, between the Equator and Polar Circle

Climate.	Longeſt Day.	Begins Latitude.	Ends Latitude.	Breadth.
1	12½ Ho.	0°- 0′	8°- 34′	8°- 34′
2	13	8 - 34	16 - 43	8 - 09
3	13½	16 - 43	24 - 11	7 - 28
4	14	24 - 11	30 - 45	6 - 34
5	14½	30 - 45	36 - 30	5 - 45
6	15	36 - 30	41 - 22	4 - 52
7	15½	41 - 22	45 - 31	4 - 09
8	16	45 - 31	49 - 01	3 - 30
9	16½	49 - 01	51 - 58	2 - 57
10	17	51 - 58	54 - 29	2 - 31
11	17½	54 - 29	56 - 37	2 - 08
12	18	56 - 37	58 - 26	1 - 49
13	18½	58 - 26	59 - 59	1 - 33
14	19	59 - 59	61 - 18	1 - 19
15	19½	61 - 18	62 - 25	1 - 07
16	20	62 - 25	63 - 21	0 - 56
17	20½	63 - 21	64 - 09	0 - 48
18	21	64 - 09	64 - 49	0 - 40
19	21½	64 - 49	65 - 21	0 - 32
20	22	65 - 21	65 - 45	0 - 24
21	22½	65 - 45	66 - 06	0 - 21
22	23	66 - 06	66 - 20	0 - 14
23	23½	66 - 20	66 - 28	0 - 08
24	24	66 - 28	66 - 31	0 - 03

Table of Climates between the Polar Circles and the Pole

Climates.	Longeſt Day.	Begins Latitude.	Ends Latitude.	Breadths.
25	1 Month.	66°- 31′	67°- 21′	0°- 50′
26	2	67 - 21	69 - 48	2 - 27
27	3	69 - 48	73 - 37	3 - 49
28	4	73 - 37	78 - 30	4 - 53
29	5	78 - 30	84 - 05	5 - 35
30	6	84 - 05	90 - 00	5 - 55

Th

The terraqueous globe, or globe of the earth and waters, is divided by nature into continents, iſlands, peninſulas, iſthmuſes mountains, promontories or capes, hills, and valleys; oceans, ſeas, lakes, gulfs or bays, ſtraits, ports or harbours, rivers, rocks, ſhelves, banks, marſhes, and bogs.

A continent, called ſometimes the main-land, is a large tract of land containing ſeveral contiguous countries, empires, kingdoms, or ſtates.

An iſland is a piece of land wholly ſurrounded by the ocean, ſea, or other water, and ſo divided from the continent.

A peninſula (that is to ſay, *almoſt an iſland*) is a piece of land compaſſed by water, except on one ſide, where it is joined to the continent, or other land.

An iſthmus is that neck or narrow piece of land that joins a peninſula to the continent.

A mountain is a part of the earth which is conſiderably higher or more elevated than other lands near it.

A promontory is a mountain running out into the ſea, the extremity of which is called a cape or head-land.

A hill is a leſſer kind of mountain; and a valley is that land which is ſituated at the bottom of a mountain or hill, or between two or more ſuch.

The ocean is a vaſt body of ſalt water, which ſeparates ſome of the continents, and waſhes their borders or ſhores.

A ſea is a branch of the ocean flowing between ſome parts of the continents, or ſeparating iſlands from them.

A lake is a body of waters every where ſurrounded by the land.

A gulf or bay is a part of the ocean or ſea contained between two ſhores, and is encompaſſed by the land except on one ſide, where it communicates with the other waters.

A ſtrait is a narrow paſſage, whereby ſeas, gulfs, and bays, communicate with the ocean, or with one another.

A port or harbour is a part of the ocean or ſea ſo incloſed by the land, that ſhips may ride in ſafety therein.

A river is a running water deſcending in a narrow channel from the mountains or other high lands, and emptying itſelf into ſome ocean, ſea, lake, or other river.

Rocks are great ſtones; ſhelves and banks are eminences conſiſting of ſtones, ſands, or other matter, which

Marſhes

obſtruct the paſſage of ſhips at ſea, and often prove fatal to thoſe who do not keep clear of them.

Marſhes are lands lying low, which are liable to be overflowed by the ſea or rivers; and bogs are mixtures of land and water, over or among which it is dangerous to attempt a paſſage.

The known parts of the earth are commonly divided into four parts, *viz.* Europe, Aſia, Africa, America; the firſt three were known to the ancients, and are for that reaſon called the old world; the fourth was diſcovered about 300 years ago, and is therefore called the new world.

The lands which lie towards the north and ſouth poles are very little known: that toward the north is called *Terra Arctica*, and that towards the ſouth pole, *Terra Antarctica*, or *Terra Auſtralis Incognita*; the latter is ſuppoſed by ſome to be nearly as big as Europe, Aſia and Africa.

The ocean aſſumes different names in different parts of the earth; and the ſeas, gulfs, and bays, are named moſtly from the lands to which they adjoin; it is thought therefore moſt convenient, in this ſhort ſketch, to deſcribe the lands and waters together; and firſt of

EUROPE, *and the adjacent Waters.*

EUROPE is bounded on the north, by the northern or frozen ocean; on the weſt, by the north Atlantic or weſtern ocean; which ſeparates it from America; on the ſouth by the Mediterranean ſea, ſeparating it from Africa; and on the eaſt by Aſia, to which it adjoins, without any viſible limits toward the northern parts; but on the ſouthern, the river Tanais, the Palus Mæotis, or ſea De la Zabacche, the ſtraits of Caffa, the Euxine, or Black Sea, the ſtraits of Conſtantinople, the ſea of Marmora, the ſtraits of the Dardanelles, and the Archipelago, ſerve to ſeparate them.

The dimenſions of Europe may be partly conceived by the meaſures following; Conſtantinople, the capital of Turkey, (ſituate in latitude 41° 0′ N. longitude 28° 5′ E.) bears from Cape St. Vincent, the ſouth-weſt point of land in Portugal, (ſituate in latitude 36° 41′ N. longitude 8° 1′

9° 12′ W.) N. 81° 40′ E. being 1770 geographical miles* diſtant therefrom.

Cape Mala the ſouthern point of Turkey, in lat. 37° 20′ N. long. 24° 7′ E.) bears from the north cape (in lat. 71° 27′ N. long. 26° 30′ E., S. 2° 15′ W. diſtance 2058 miles.

Europe contains the following empires, kingdoms, regions, or ſtates, *viz.* Spain, Portugal, France, Italy, Turkey, Great Britain, the Netherlands, Germany, Hungary, Poland, Denmark, Sweden, and Muſcovy.

Spain and Portugal are ſurrounded by the ſea on three ſides; on the ſouth and ſouth-eaſt by the Mediterranean, which communicates with the Atlantic or weſtern ocean, by the ſtraits of Gibraltar; on the weſt by the ſaid ocean; and on the north by the ſame, or a part thereof, called the Bay of Biſcay; on the north-eaſt by the Pyrenean mountains, which (reaching from the Mediterranean to the Bay of Biſcay) ſeparate it from France.

Portugal is now a kingdom ſeparate from Spain, to which it was heretofore ſubject; it is ſituate on the ocean, which waſhes it on the weſt and ſouth; it has Galicia on the north, and borders upon Leon, Old Caſtile, New Caſtile, and Andaluſia on the weſt; it is hardly 300 miles in length from north to ſouth, and about 100 in breadth. The capital city is Liſbon, which is now in a ruinous condition, being almoſt totally deſtroyed by an earthquake, and a fire which ſucceeded it, in 1755. The city of Oporto is alſo a place of great trade.

Moſt of the other provinces of Spain were alſo formerly ſeparate kingdoms; ſuch were Andaluſia, in which Gibraltar is ſituated, as are the cities of Seville and Cadiz; Grenada within the ſtraits, the principal city has the ſame name: and on the Mediterranean are ſituated the ports of Malaga and Almeria; Murcia more eaſtward in the Mediterranean, in which, beſide a city of the ſame name, is the city and port of Carthagena; Valencia north-eaſtward of Murcia; this has a city and ſea-port of the ſame name, and another port of great trade, called *Alicant*.

In

* *Geographical miles may be reduced to Engliſh miles, by adding to their number one ſixth of the ſame; thus* 1700 *geographical miles are equal to* 1700 *and* 283, *or* 1983 *Engliſh miles.*

In the inland parts are the kingdoms of Old Caſtile, New Caſtile, and Leon; and near the confines of France, thoſe of Arragon and Navarre; the principal cities of Old Caſtile are Burgos and Valadolid; of New Caſtile, Madrid, the king's reſidence, and Toledo; of Leon, Salamanca and Leon; of Arragon, Saragoſſa; and of Navarre, Pampelona and Eſtella.

The kingdom of Galicia is ſituate on the ocean in the north weſt part of Spain; its principal cities are Compoſtella and Corunna, or the Groyne, which is a ſea-port; the principality of Aſturias gives title to the king of Spain's eldeſt ſon; it is ſituate eaſt ward on the Bay of Biſcay, the principal city is called Oviedo; the province of Biſcay, ſtill more eaſtward, lies on the bay of that name, and has two ports of conſequence, Bilboa and St. Sebaſtian.

Laſtly, The principality of Cataionia is ſituated on the Mediterranean, and is the moſt eaſtern province of Spain; in this is the city and port of Barcelona, which is not inferior to any of the above-named. Not far from which are the Balearic iſles, called Majorca, Minorca, and Ivica.

Proceeding eaſtward along the Mediterranean ſea is the kingdom of France, which is bounded on the eaſt by Italy and Germany, on the north by the Netherlands, and the Engliſh channel, on the weſt by the Bay of Biſcay, and to the ſouth by the Pyrenees, which ſeparate it from Spain, and a part of the Mediterranean.

France conſiſts of twelve provinces; the ſouthern are Guienne and Gaſcony, whoſe chief town is Bourdeaux; Languedoc, whoſe capital is Thouloufe; Dauphine, whoſe principal city is Grenoble; and Provence, whoſe capital is Aix; this province has two very conſiderable ſea-ports, called Toulon and Marſeilles.

More northerly are the provinces of Bretagne, Orleannois, Burgoine, and Lionois, whoſe capitals are Rennes, Orleans, Dijon, and Lions; and ſtill more northward are Normandy, the Iſle of France, Campaigne, and Picardy, whoſe chief towns are Rouen, Paris, (the capital of the kingdom), Troyes, and Amiens.

Although the provinces of France have not the ſuperb titles of kingdoms, as thoſe of Spain have, yet ſome of them are more extenſive, rich, and populous, than ſome of thoſe kingdoms.

Italy

Italy is divided from France on the weſt, by the river Var, and part of the Alps; from Germany on the north by the ſame mountains called the Alps; and is every where elſe ſurrounded by the Mediterranean ſea, and the gulf of Venice, which is a branch thereof.

This country is divided into a great many territories, governed in different manners.

The dukedom of Savoy, ſituated partly among the Alps, the capital of which is Chamberry; and the principality of Piedmont, whoſe capital is Turin, are ſubject to the king of Sardinia; the duchies of Milan and Mantua, whoſe capitals bear the ſame names, are ſubject to the queen of Hungary; the duchy of Montferrat, whoſe capital is Caſal; and thoſe of Parma and Modena, having capitals of the ſame name, are governed by their own dukes; Venice, Genoa, Lucca, and St Marino, are the capitals of four republics called by thoſe names; Trent is governed by its biſhop; Rome and its dependencies by the Pope; the grand duchy of Tuſcany, (the capital of which is Florence) is ſubject to the preſent emperor of Germany; and Naples, the capital of a kingdom, ſituated at the ſouthern extremity, together with the iſland of Sicily, from which it is divided by a narrow ſtrait, are ſubject to the ſame king. The chief city of Sicily is called Palermo.

There are two other large iſlands, Sardinia, (whoſe capital is Cagliari) ſubject to its king; and Corſica, (whoſe capital is Baſtia) at preſent ſubject to France; alſo a ſmall one to the ſouth of Sicily called Malta; ſubject to the knights of Malta.

More to the eaſtward is Turkey in Europe, which conſiſts of many provinces; Conſtantinople in the eaſtern part thereof being the reſidence of the Grand Seignior, the ſovereign of this empire.

The names of thoſe provinces, and their capital cities,

Provinces.	*Chief Cities.*
Dalmatia,	Spalatro,
Boſnia,	Belgrade,
Servia,	Semandria,
Tranſylvania,	Hermanſtadt,
Valachia,	Tergowick,
Moldavia,	Saczow,
Bulgaria,	Sophia,
Crim Tartary,	Precop,

Romania,

Romania,	Conſtantinople,
Grecia,	Saloniki.

To theſe muſt be added the iſlands of the Archipelag which are very numerous.

GREAT BRITAIN is a large iſland, having divers leſſ ones dependent on it. It conſiſted ſome years ago, two diſtinct kingdoms, under one ſovereign, called En land and Scotland: It is thought convenient to be mo particular in the deſcription thereof, than we are wi regard to other countries. We ſhall therefore give t following

Account of the ſeveral Counties of England and Wales, wi their produce, market-towns, and market-days, &c.

Note, m ſtands for Monday, *tu* for Tueſday, *w* for We neſday, *th* for Thurſday, *f* for Friday, and *ſ* Saturda

Berkſhire,

Is ſuppoſed to contain about 527,000 acres; it is 1 miles in circumference; hath plenty of corn, cattl wool, and wood, eſpecially oak, and is accomm da with water-carriage by the very fine rivers of Thames a Kennet;

And hath theſe market-towns, viz.

Reading, the ſhire-town, market on Saturday.	Hungerford, *w*
	Newberry, *th*
Abingdon, *m* and *f*	Farringdon, *tu*
Windſor, *f*	Wantage, *ſ*
Wallingford, *tu* and *f*	Eaſt Iſley, *w*
Maidenhead, *w*	Oakingham, *th*

Buckinghamſhire,

Is an inland county as well as Berkſhire; it contai about 441,000 acres, is 183 miles in circumferenc abounds in corn and cattle, and is very conſiderable f wool. The principal rivers in this ſhire are Tame, Ou and Coln.

Market-towns.

Buckingham, *ſ*	Wendover, *th*
Ayleſbury, *ſ*	Amerſham, *tu*
High Wickham, *ſ*	New-port Pagnel *ſ*
Marlow, *ſ*	Colebroke, *w*
Stony Stratford, *ſ*	Riſborough, *ſ*
Oundle, *m*	Invingho, *ſ*
Beaconſfield, *th*	Winſlow, *tu*
Cheſham, *w*	

Bedfordſhi

Bedfordshire,

Contains about 260,000 acres is 73 miles in circumference, well stored with corn and cattle, and famous for fullers-earth, *&c.*

Market-towns.

Bedford, *th* and *f*	Lutton, *m*
Dunstable, *w*	Shefford, *f*
Wooburn, *f*	Biggleswade, *th*
Amptonhill, *th*	Potton, *f*
Leighton, *m*	Tuddington, *f*

Cambridgeshire,

Is an inland county, contains about 570,000 acres, is 130 miles in circumference, and affords plenty of corn, cattle, and wild-fowl: Cambridge is the shire-town, and remarkable for a famous university, containing 12 colleges, and 4 halls, all well endowed, and are as followeth, *viz.*

Colleges,

When founded.		By whom founded.
1284	Peterhouse,	by Hugh de Bathom, Bp of Ely
1346	Corpus Christi, or Bennet,	by Henry of Monmouth, Duke of Lancaster.
1348	Gonvil and Caius	so called from its several founders.
1441	King's,	by King Henry VI.
1448	Queen's,	by Margaret his queen.
1497	Jesus,	by J. Alcoke, L.L.D. Bp of Ely.
1506	Christ's, & St. John's,	by Marg. Countess of Richm.
1542	Magdalen,	by Ed. Stafford, D. of Bucks.
1546	Trinity,	by King Henry VIII.
1584	Emmanuel,	by Sir Walter Mildmay.
1598	Sidney Sussex,	by Frances Sidney, Countess of Sussex.

Halls.

1343	Clare,	by Richard Badew.
1347	Pembroke,	by Mary Countess of Pembr.
1353	Trinity,	by W. Bateman, Bp of Norwich
1549	Catharine	by Robert Wood the Chancellor.

Market-towns.

Cambridge, *f*	Merche, *f*
Ely, *tu*	Wisbich, *f*
Caxton, *tu*	Royston, *w*
Linton, *th*	Soham, *f*
New Market, *tu*	

Cheſhire,

Is a maritime or ſea-county, containing 720,000 acre and is in circumference about 118 miles. Cheeſe an ſalt are the principal commodities: for the firſt, n place in the world equals it; and for the latter, if ther was but a ſufficient quantity, there would be no occaſio for voyages to the Iſle of May.

Market-towns.

Cheſter, *w* and *f*	Frodſham, *w*
Congleton, *f*	Stockport, *f*
Namptwich, *f*	Sandwich, *th*
Middlewich, *f*	Aſtringham, *tu*
Norwich, *f*	Malpas, *m*
Macclesfield, *m*	Knotsford, *f*

Cornwall,

Is a maritime county in the moſt weſtern part of th kingdom, containing about 900,000 acres, and is 1 miles in circumference. Its chief commodities are ti and copper; it alſo affords great plenty of wild fow eſpecially wood-cocks in the ſeaſon; it likewiſe yield great quantities of ſamphire, eringo, fine ſlate, and mar ble; above all the reſt, vaſt quantities of fiſh, which ar yearly exported to France, Spain, and other foreig countries.

Market-towns.

Launceſton, the ch. town, *f*	Padſtow, *f*
Leſkard, *f*	Cameiford, *f*
Leſtwithiel, *f*	Grampound, *f*
Truro, *w* and *f*	Penryn, *w*, *f*, and *f*
Bodmin, *f*	Tregony, *f*
Helſton, *f*	St Ives, *w* and *f*
Penſance, *th*	St Columbe, *th*
Fowey, *f*	Falmouth, *th*
St Germain, *f*	Market-jew, *th*

Cumberland,

Is alſo a maritime county, bounded northward wit Scotland, and weſtward with the Iriſh ſea; it contain about 1,040,000 acres, and is in circumference 168 miles it is a fruitful country, affording good paſture on th hills, and good corn in plenty in the valleys; fiſh an wild fowl are very plentiful, and coals in abundance likewiſe large mines of lead and copper, which are bot very good in their kind.

Market

Market-towns.

Carliſle is the chief, *ſ*	Holm, *ſ.*
Cockermouth, *tu*	Egremont, *ſ*
Whitehaven, *th*	Kirk Oſwald, *th*
Penrith, *tu*	Longtown, *th.*
Keſwick, *ſ*	Ravenglaſs, *ſ*
Brampton, *tu*	Wigton, *tu.*

Derbyſhire,

Is an inland county, 130 miles in circumference, and contains about 680,000 acres, affords great ſtore of corn and wood, likewiſe conſiderable quantities of free-ſtone and marble, coal and lead mines in abundance; alſo it yields cryſtal and alabaſter.

Market towns.

Derby, the county-town, *ſ*	Aſhburn, *ſ*
Cheſterfield, *ſ*	Alfreton, & Bakewell, *tu*
Workſworth, *tu.*	Dronsfield, *th*
Bolſover, *ſ*	Fiddlewall, *w*

Devonſhire,

Is a maritime county, about 200 miles in circumference, and contains near 1,920,000 acres, it lies on the weſt of England, and joins to Cornwall, having the ſea on the north and ſouth; it affords great plenty of corn, wool, fowl, fiſh, as alſo lead and tin mines; but the principal manufactures are kerſies, ſerges, and lace.

Market-towns.

Exeter is the cap. *w* and *ſ*	Honiton, *ſ*
Barnſtaple, *ſ*	Oakhampton, *ſ*
Crimpton, *ſ*	Axminſter, *ſ*
Taviſtock, *ſ*	Culliton, *tu*
Dawerton, *tu*	Dodbrook, *w*
Plymouth, *m* and *tu*	Autrey, *tu*
Totneſs, *ſ*	Cudee, *ſ*
Aſhburton, *ſ*	Hatherleo, *tu*
Biddeford, *tu*	Moreton, *ſ*
Torrington, *ſ*	Kingſbridge, *ſ*

Dorſetſhire,

Is a county exceeding pleaſant and fruitful, and lies upon the channel, being 150 miles in circumference, and contains about 772,000 acres, yielding great plenty of corn, cattle, wool, fiſh, and wild fowl; and it alſo affords abundance of hemp, free-ſtone, and marble.

Market-towns.

Dorcheſter is the county-town, *ſ*	Cranborn; *w*
	Blandford, *ſ*
Weymouth, *tu* and *ſ*	Abbotſbury, *th*
Melcombe Regis, *tu* and *ſ*	Cerne, *w*
Shaftſbury, *ſ*	Frampton, *th*
Pool, *m* and *tu*	Sherbourn, *tu* and *ſ*
Wareham, *ſ*	Wimbourn, *ſ*
Corf-caſtle, *tu*	Sturminſter, *th*

Durham,

Is a county-palatine, and lies very far in the north o the kingdom, the air very cold, and the ground not ſ fruitful as in the ſouthern parts; it is 107 miles in cir cumference, and contains about 610,000 acres; its chie commodities are coal, iron, and lead.

Market-towns.

Durham is the principal, *ſ*	Sunderland, *ſ*
Aukland, *th*	Bernard's caſtle, *w*
Darlington, *m*	

Eſſex,

Is a county bounded by the ſea, and lies in the eaſter part of England; is 146 miles in circumference, an contains 1,240,000 acres; the ſoil yields plenty of corn cattle, and wood; at Walden it affords great ſtore o ſaffron, and the beſt in the whole world, the Spaniſ being nothing in compariſon to it.

Market-towns.

Colcheſter, the county-town, *ſ*	Bruntwood *th*
Harwich, *tu*	Dunmore *ſ*
Malden *ſ*	Coggleſhal *ſ*
Chelmsford *ſ*	Grayes *th*
Barking *ſ*	Halſtead *ſ*
Hatfield *ſ*	Hornden *ſ*
Rumford *w*	Raleigh *ſ*
Walden *ſ*	Manningtree *m*
Epping, *th* and *ſ*	Waltham-abbey *tu*
Brakt ee *w*	Troxſtead *ſ*
Billericay *tu*	Sudbury *ſ*

Glouceſterſhire.

Is a country exceeding fruitful and delightful; and taken altogether, one of the pleaſanteſt parts of the king dom; it contains about 800,000 acres, affords ſome o the beſt cheeſe in the nation, and wool hardly inferior t Spaniſh. It alſo abounds in wood, iron, ſteel, and ſa

mon

most; but its chiefeſt manufacture is the woolen, which is very extraord nary.

Market-towns.

Glouceſter is the county-town *w* and	Lechlade *tu*
	Newent *f*
Cirenceſter *m* and *f*	Sudbury *th*
Tewkſbury *f*	Painſwick *tu*
Blackley *w*	Stow *th*
Durſley *th*	Tetbury *w*
Cambden *w*	Wickmore, *m*
Newnham, *f*	Thornbury, *f*
Stroud, *f*	Winchcomb, *f*
Cheltenham, *th*	Wotton, *f*

Hampſhire,

Or the county of Southampton, borders upon the channel, and is a pleaſant, healthful, and fruitful country, about 140 miles in circumference, and contains about 1,312,500 acres: it affords vaſt plenty of corn, graſs, ſheep, and wood, and is particularly famous for hogs and honey, both of which are moſt excellent in their kind.

Market-towns.

Southampton, the county-town *tu* and *f*	Wincheſter *w* and *f*
	Portſmouth *th* and *f*
Andover *f*	Ringwood *w*
Limington *f*	Odiham *f*
Alton *f*	Rumſey *f*
Baſingſtoke *w*	Alceſton *th*
Kingſclear *tu*	

To this county belongs the Iſle of Wight, of a very conſiderable extent, the principal town Newport.

Hartfordſhire,

Is a very fine incloſed county, the land ſomewhat ſtony, but yet very fruitful, affording great plenty of corn, and is very remarkable for good malt; it is 130 miles in circuit, contains about 451,023 acres, and hath an excellent air, *&c.*

Market-towns.

Hartford is the county-town *f*	Buntingford *m*
	Baldock *th*
St Alban's *f*	Hitchin *th*
Barnet *m*	Hodſon *th*
Ware *tu*	Stevenage *f*
Barkhamſtead *m*	Tring *f*

Rickmanſworth *ſ*	Watford *tu*	
Hatfield *th*	Hempſtead *th*	

Herefordſhire,

Is an inland county, of a good ſoil, and healthful air 100 miles in circuit, and contains about 660,000 acres; it affords plenty of wool, wheat, ſalmon, and cyder which are generally eſteemed the beſt in the kingdom.

Market-towns.

Hereford is the capital *w ſ* & *ſ*	Weobly *th*	Pemb *tu*
Leominſter, *ſ*	Kyneton *w*	Ledbury *tu*
	Roſs *th*	Bromyard *m*

Huntingdonſhire,

Is a ſmall inland county, of about 67 miles in circuit, and contains about 240,000 acres: it is an open country, but generally very fertile and delightful, abounding in corn and cattle, which are its chiefeſt commodities.

Market-towns.

Huntingdon the chief, *ſ*	St. Neots, *th*
St. Ives, *m*	Ramſay, *w*
Kimbolton, *f*	Yaxley, *tu*

Kent,

Is a ſea-county on the eaſt part of the channel; it is 160 miles in circumference, contains about 1,248,000 acres, being diſtinguiſhed into three parts, viz. the marſhy, as Romney-marſh, &c. the downs, and the middle, or woody part. It affords plenty of corn, good paſture, and the beſt cherries and pippins in the kingdom.

Market-towns.

Canterbury (famous for its cathedral) is the capital, *w* and *f*	Hithe, *ſ*	Lidd, *th*
	Bromley, *th*	Sevenoak, *ſ*
	Cranebrook, *f*	Tenterden, *f*
	Cray, *w*	Malling, *ſ*
Rocheſter, *f*	Dartford, *ſ*	Milton, *ſ*
Maidſtone, *th*	Eltham, *m*	Tunbridge. *ſ*
Dover, *w* and *ſ*	Feverſham, *w* & *ſ*	Weſtram, *w*
Sandwich, *w* and *ſ*	Folkſtone, *th*	Woolwich, *ſ*
Romney, *th*	Graveſend, *w* & *ſ*	Wrotham, *tu*
Smarden, *f*	Lentham, *tu*	Wye, *th*

Suſſex,

Is a maritime county, lying upon the channel between Kent and Hampſhire, containing 1,140,000 acres, and is 158 miles in circumference. This county is both fertile and healthful, and is exceedingly pleaſant; the ſouth downs being the moſt delectable or delightful part of the whole

whole kingdom; and, as I know them, I alledge them to have the moſt beautiful variety, and the pleaſanteſt proſpect that can be in the whole culture of nature; the ſoil being exceeding rich, occaſioned by the numerous flocks of ſheep kept there; and therefore produce wonderful crops of corn of all ſorts: it alſo hath the fineſt woods and rivers, and affords the beſt game for hunting, fiſhing and fowling.

Market towns.

Chicheſter is the chief *w* and *f*	Midhurſt *th*
	Steyning *w*
Eaſt Grinſtead *th*	Petworth *w*
Haſtings *w* and *f*	Battle *th*
Rye *w* and *f*	Hailſham *f*
Arundel *w* and *f*	Bright Helmſtone *th*
Horſham *f*	Cuckfield *f*

Lancaſhire,

Is a ſea-coaſt county, bounded on the weſt by the Iriſh ſea; it is 170 miles in circuit, and contains 1,150,000 acres; the air is very wholeſome, and the people generally live to an advanced age; the ſoil is very good, and yields corn of all ſorts, particularly oats, which are looked upon as the beſt in the kingdom: it affords alſo plenty of pit-coal, and great quantities of excellent fiſh of all ſorts.

Market-towns.

Lancaſter is the county-town *f*	Ulverſtone *th*	Rochdale *tu*
	Bolton *m*	Howſtead *m*
Clithero *f*	Blackbourn *m*	Hoſtingdon *w*
Liverpool *f*	Cartmel *m*	Garſtang *th*
Preſton *w f* & *f*	Coln *w*	Kirkham *tu*
Wigan *m* and *f*	Bury *th*	Hornby *m*
Manchester *f*	Charnley *tu*	Ormſkirk *tu*
Warrington *w*	Dalton *f*	Poulton *m*

Leiceſterſhire,

Is a fine pleaſant inland county, 96 miles in circuit, contains about 560,000 acres, abounds in corn and good paſture, and is very remarkable for beans and peas for horſes, which thrive there the beſt of any county in England; it is alſo eminent for large ſheep, which produce abundance of wool, and the longeſt in the kingdom.

Market-towns.

Leiceſter is the county-town *m* and *f*	Hinkley *m*
	Lutterworth *th*

Aſhby

Aſhby de la Zouch *f*	Loughborough *th.*
Boſworth *w*	Melton *tu*
Harborough *tu*	Mountſorrel *m*
Hallaton *th*	Waltham *w* and *th*

Lincolnſhire,

Is a maritime county, part bordering on the Germa ſea, and contains about 1,740,000 acres, being 180 mile in circuit: the weſtern parts are good and fruitful, have ing plenty of graſs, and breed the largeſt oxen in th kingdom, but the eaſtern parts are marſhy, though we ſtored with wild-fowl.

Market-towns.

Lincoln the cap. *f*	Stanton *m*	Wainfleet *f*
Boſton *w* and *f*	Binbrook *w*	Dunnington *f*
Grantham *f*	Alford *tu*	Falkingham *th*
Stamford *m* and *f*	Burton *m*	Holbeck *th*
Grimſby *w*	Barton *m*	Horncaſtle *f*
Gainſborough *tu*	Kirton *th*	Louthe *w* and *f*
Bolinbrook *tu*	Bourn *f*	Sleeford *m*
Spalding *tu*	Tatterſhall *f*	Spilſby *m*

Middleſex,

Is the metropolis of the kingdom, and an inland county having the ſoil fertile by improvement, and the air ſwe and wholeſome as any in the kingdom: the Thames par it from the county of Surry, and is on moſt accounts th fineſt river in the world.

Market-towns.

London, the metropolis, hath markets for every day in the week.	Stains *f*
	Uxbridge *th*
	Enfield *f*
Weſtminſter *m*, *w*, and *f*	Edgeworth *th*
Brentford *th*	

Monmouthſhire,

Lies upon the border of Wales, was formerly reckoned a part of it, but is now numbered among the Engli counties: it is accommodated by the famous river Sever the ſecond in the kingdom; and contains 34,00 acres, being 80 miles in circuit. This county is healt ful, abounding with corn, cattle, ſalmon, and trout.

Market-towns.

Monmouth, the principal *f*	Caerleon *tu*	Pontipool *f*
	Chepſtow *f*	Uſke *m* and *f*
Abergavenny *tu*	Newport *f*	

Norfolk

Norfolk,

Is a large county, bordering on the northern coaſt upon the German ſea; it is 180 miles in circuit, and contains 1,148,000 acres. The ſoil is different; in ſome places fertile, in others ſandy, and in others deep and heavy. Its principal commodities are corn, wool, honey, and ſome ſaffron; but chiefly ſtuffs and herrings, the firſt from Norwich, and the latter from Yarmouth. Sometimes jet and amber are found on the ſea-coaſt.

Market towns.

Norwich the capital, *w f* and *f*	Walſingham *f*	Cromer *f*
Lynn *tu* and *f*	Downham *f*	Dis *f*
Yarmouth *f*	Walſham *w*	Harleſton *w*
Thetford *f*	Windham *f*	Herling *tu*
Attleborough *th*	Ropeham *f*	Holt *f*
Aleſham	Snaſham *f*	Wotton *w*
Buckingham *f*	Falkenham *th*	Worſted *f*
Burnham *f*	Foulſham *th*	Seby, every 2d monday.
Derenam *f*	Hingſham *f*	
	Caſton *tu*	

Northamptonſhire,

Is accounted one of the fineſt inland counties in the kingdom; is 120 miles in circuit, and contains about 550,000 acres.

Market-towns,

Northampton is the county-town *f*	Daventry *w*	Wellinborough *w*
Peterborough *f*	Oundle *f*	Kettering *f*
Bracley *w*	Towceſter *f*	Trapſtove *tu*
	Rothwell *m*	Cliff *tu*

Northumberland,

Is a ſea-county, bordering upon Scotland; in ſome parts the air is ſharp, the ſoil thin and barren; but towards the ſea it is tolerably fruitful. In this county are abundance of lead and coal mines, and from hence come the coals called ſea-coals. Here are good ſtore of wild fowl and fiſh, particularly ſalmon.

Market-towns.

Newcaſtle the chief *f*	Hexham *tu*
Berwick *f*	Wooller *tu*
Alnwick *f*	Belford *f*
Morpeth *w*	Rodbury *f*

Nottinghamſhire,

Is an inland county, in circuit 110 miles, and contains 560,000 acres: the air is good, and healthful, the ſoil but

but indifferent, (a great part being foreſt ground) the ſouth part pretty fruitful, the weſt woody, and yields plenty of pit-coal. The river Trent divides it from Lincolnſhire.

Market-towns.

Nottingham is the county-town, *w, f* and *s*
Newark, *w*
Redford, *s*
Mansfield, *th*
Southwell, *s*
Bingham, *th*
Worksop, *w*
Tuxford in the clay, *w*

Oxfordshire,

Is one of the moſt pleaſant, healthful, and fertile counties in the kingdom; it is watered with delightful rivers, as the Thames, the beautiful Cherrald, &c. but above all, it is famous for having the fineſt univerſity in the world, which conſiſts of 20 colleges endowed, and five halls not endowed, viz.

Colleges.

Anno Founded.		By whom founded.
872	Univerſity, ——	by the Saxon King Alfred.
1262	Baliol, ——	by John Baliol King of Scotland.
1274	Merton, ——	by Walter de Merton, Biſhop of Rocheſter.
1316	Exeter, ——	by Walt. Stapleton, B. of Exeter.
1325	Oriel, ——	by King Edward II.
1340	Queen's, ——	by Robert Eaglesford, B. D.
1375	New, ——	by William of Wickham, Bp. of Wincheſter.
1427	Lincoln, —	by Rich. Fleming and Thomas Rotherham, Bps. of Lincoln.
1437	All-ſouls, —	by Henry Chichely, Apb. of Canterbury.
1459	Magdalen, —	by William of Wainfleet, Biſhop of Wincheſter.
1511	Brazen-noſe, —	by Will. Smith, Bp. of Lincoln, and Sir Rich. Sutton, Knt.
1516	Corpus Chriſti,	by Rich. Fox, Bp of Wincheſter.
1549	Chriſt-Church,	by King Henry VIII.
1555	Trinity ——	by Sir Thomas Pope.
1557	St. John's, ——	by Sir Tho. White, Lord Mayor of London.
1571	Jeſus, —	by Queen Elizabeth.
1609	Wadham, —	by Nicholas Wadham, Eſq.

1620 Pembroke, — by Thomas Tesdale, Esq. and Richard Whitwitch, B. D.
1700 Worcester, by Sir Thomas Cooke.
1740 Hartford, — by Dr. Newton.

Halls.

St. Edmund's, St. Alban's, St. Mary's, New-inn, Magdalen } belonging to { Queen's, Merton, Oriel, New, Magdalen } College.

Market-towns in Oxfordshire.

Oxford, the capital, *w* and *s*	Henly, *th*	Deddington, *f*
Woodstock, *tu*	Wattlington, *s*	Bicester, *f*
Banbury, *tu*	Whitney, *th*	Bampton, *w*
Burford, *s*	Chipping-Norton, *s*	Tame *tu*
		Charlbury, *s*

Rutland,

Is a small inland county, 40 miles in circumference, containing about 110,000 acres; affords plenty of corn and cattle; and is remarkable for the redness of the wool which the sheep of that country produce occasioned by the colour of the soil

Market-towns.

Oakhampton, *f* | Uppingham, *w*

Shropshire,

Is a plentiful inland county, the air good, and so is the soil; it is in circuit 134 miles, containing about 890,000 acres, and affords plenty of corn, wood, and pit-coal, being accommodated by the river Severn.

Market-towns.

Shrewsbury, the county-town, *w*, *th*, and *s*	Wenlock, *m*	Churchstreton, *tu*
	Elismere, *tu*	Oswestry, *m*
Bishop's castle, *f*	Whitchurch, *f*	Bridgenorth, *s*
Ludlow, *m*	Drayton, *w*	Newport *s*
	Wem, *th*	Shipton, *tu*

Somersetshire,

Is a large plentiful sea-county in the west of England, in circumference 204 miles, containing about 907,500 acres; it affords great plenty of excellent corn, and good pasture, which feeds abundance of fine cattle; and also yields plenty of lead, copper, crystal stones, and woad for dyers; its chief manufactures are cloth and serges

Market-

Market-towns.

Briſtol is the capital *w* and *ſ*	South-petherton, *th*	Wivelſcomb *t*
Bath *w* and *ſ*	Axbridge, *th*	Caneſham *th*
Wells *w* and *ſ*	Sheptonmallet *ſ*	Crookhorn *ſ*
Bridgewater *th*	Somerton *m*	Dulverton *ſ*
Ilcheſter *w*	Wellington *tu*	Glaſtonbury *tu*
Taunton *w* and *ſ*	Bruton *ſ*	Chard *m*
Wincanton *w*	Ilminſter *ſ*	Longport *ſ*
Watchet *ſ*	Dunſtar *ſ*	Pontford *tu*
		Writon *tu*

Staffordſhire,

Is an inland county, containing about 810,000 acr and is 141 miles in circuit; the air is ſharp, but ve healthful; the ſoil different: northward it is hilly a barren; but ſouthward it is fruitful and pleaſant, a affords plenty of corn, graſs, iron, and pit-coal; t middle part is level, but ſomewhat woody: this county ſo affords good ſtone, marble, alabaſter, and lime-ſtone

Market-towns.

Stafford is the county town, *ſ*	Utexater, *w*	Betley, *tu*
Litchfield, *tu* and *ſ*	Eccleſhall, *ſ*	Lucke, *w*
Newcaſtle, *m*	Ridgley, *tu*	Tudbury, *tu*
Burton, *th*	Browley, *tu*	Stow, *tu*
Penkridge, *tu*	Breewood, *tu*	Wolverhampton, *w*
	Walſhal, *tu*	

Suffolk,

Is a ſea-county, 140 miles in compaſs, and conta 995,000 acres; the ſoil different, the beſt part about Edmunſbury; it affords abundance of cattle, and but the beſt, but cheeſe the worſt in England.

Market-towns.

Ipſwich is the principal, *w ſ* and *ſ*	Ixworth, *ſ*	Neyland, *ſ*
	Needham, *w*	Laventham, *t*
	St. wmarket, *th*	Mildenhall, *ſ*
Dunwich, *ſ*	Newmarket, *th*	Bildeſton, *w*
Orford, *m*	Beccles, *ſ*	Clare, *ſ*
Aldborough, *ſ*	Bury, *w*	Bungay, *th*
Sudbury, *ſ*	Hadley, *m*	Holſworth, *tu*
Eye, *ſ*	Framlington, *ſ*	Mendleſham *t*
Dedingham, *ſ*	Leſtoff, *w*	Woodbridge,

Surry,

Is an inland county, parted by the river Thames fr Middleſex: it contains about 592,000 acres; and is compaſs 112 miles: the country is plentiful, and the

heal

healthful; it is famous for hunting and horſe-racing; the principal goods are hats, made in Southwark for exportation.

Market-towns.

Guilford is the county-town, *s*	Southwark *w* and *s*	Kingſton, *s*
Ryegate, *tu*	Darking, *th*	Croydon, *s*
		Farnham, *th*

Warwickſhire,

Is a pleaſant, healthful, and plentiful county, 155 miles in compaſs, and contains about 670,000 acres; the ſoil, for the moſt part, is good and fertile; on the north a little woody; this county is remarkable for excellent cheeſe, going by its name

Market-towns.

Warwick is the county-town *ſ*	Alceſter *tu*	Nuneaton, *ſ*
Coventry *ſ*	Birmingham *th*	Rugby *ſ*
Stratford *th*	Coleſhil *w*	Southam *m*
Atherſtone *tu*	Henley *m*	Suttoncolefield *m*
	Kyneton *tu*	

Weſtmoreland,

Is a county in the north-weſt of England; it is 120 miles in circuit, containing about 540,000 acres; this county abounds in hills and marſhes; and is not very plentiful, but in ſome of the valleys and intervals, and towards the ſouth.

Market-towns.

Appleby is the county-town *ſ*	Longſdale *th*	Kirbyſteven *ſ*
Kendal *ſ*	Burton *tu*	Orton *w*
	Ambleſide, *w*	Brough *w*

Wiltſhire,

Is a fine inland county, 140 miles in compaſs, and contains about 876,000 acres; in the middle lies Saliſbury-plain, very remarkable for its large extent, and for feeding large numbers of ſheep; and therefore wool is the principal commodity.

Market-towns.

Saliſbury is the capital, *w* and *s*	Lavington *w*	Calne *tu*
Hindon *th*	Wotton-baſſet *th*	Warminſter *ſ*
Chippingham *s*	Cricklade *s*	Bradford *m*
Wilton *w*	Deviſes *th*	Amiſbury *ſ*
Marlborough *s*	Downton *ſ*	Auburn *tu*
Malmſbury *s*	Weſtbury *ſ*	Swindon *m*
	Highworth *w*	Trowbridge *ſ*

Worceſterſhire,

Is a plentiful inland county, 130 miles in circuit, and contains 540,000 acres; the ſoil is for the moſt part

good and fertile, affords corn in plenty, and is very numerous in cattle; it yields plenty of fiſh and fruit. The vale of Eveſham is juſtly eſteemed one of the moſt fertile ſpots in the kingdom.

Market-towns.

Worceſter is the capital *w f &j*	Droitwich, *f*	Perſhore *tu*
Eveſham *m*	Stourbridge *f*	Tidbury *tu*
Bewdley *f*	Kidderminſter *th*	Upton *th*
	Bromſgrove *tu*	Shipton *f*

Yorkſhire,

Is a maritime county, and much the largeſt in all England; and is divided into three parts, called Ridings, viz. north, eaſt, and weſt: It is in general a plentiful county, abounding in corn, cattle, fiſh, and fowl, and famous for breeding fine ſaddle-horſes. It is 320 miles in circumference, and contains 3,770,000 acres; it ſends great quantities of woolen cloth to London, and elſewhere, being its chiefeſt manufacture.

Market-towns.

York is the capital; market-days Thurſday and Saturday, with 36 other market-towns, too numerous here to particularize.

The Principality of WALES.

WALES was originally independent on England; but in the reign of King Henry VII. it was incorporated with it. This country is very mountainous and barren, except in the valleys and intervals, where it yields plenty of graſs and corn. The ſituation is weſtward, bordering on the Iriſh ſea; the air bleak and ſharp, but wholeſome; the cattle are numerous, but very ſmall; and on the hills there are goats in abundance. This country is divided into North and South, *viz.*

North Wales,

Contains Angleſey, Caernarvonſhire, Denbighſhire, Flintſhire, Merionethſhire, and Montgomeryſhire.

Angleſey is an iſland no the north-weſt part of the country, about 80 miles in compaſs, and contains about 200,000 acres. It affords plenty of corn, cattle, fiſh, fowl, and milſtones, for grinding of corn, in abundance; it has but two market-towns, *viz.* Beaumaris and Newborough; Wedneſday is the market-day of the firſt, and Tueſday of the latter.

Carr-

Caernarvonſhire is a ſea-coaſt county, 110 miles in compaſs, containing about 340,000 acres. It hath plenty of corn, cattle, fiſh, and wood: the air is healthful, and the ſoil good, eſpecially in the weſtern part, which produces abundance or excellent barley.

Market-towns.

Caernarvon is the chief, *f*	Polbel, *w*
Bangor, *w*	Aberconway, *f*
Krobich, *w*	Newin, *f*

Denbighſhire is 116 miles in circuit, and contains about 410,000 acres. The middle of this county hath plenty of rye, coals, and ſheep; it alſo hath ſmall lead mines; but the chief part of it is a valley called *Diffryn Cluid*, exceeding pleaſant and fertile, adorned with ſeveral gentlemen's ſeats, and thoſe of good eſtates. Denbigh is the county-town, and the market-day on Wedneſday. Wrexham is another of its principal market-towns, a pretty town, famous for its market, neat church, and lofty ſteeple.

Flintſhire contains about 160,000 acres, and is in circuit 82 miles. It hath but three towns, *viz.* Flint, St. Aſaph, and Gairus; the firſt ſo ſmall, that it hath no market. It is a hilly country, but the vales are very fertile, and the inhabitants commonly live to an advanced age. Its commodities are ſmall cattle, butter, cheeſe, pit-coal, lead, and millſtones. In this county is St. Winifred's well, ſo famous for curing aches, lameneſs, and, as ſome ſay, for propagation.

Merionethſhire is 180 miles in circuit, and contains about 500,000 acres. The country in general is mountainous, but not without plenty of ſmall cattle, and other neceſſaries for the inhabitants. The chief manufacture is cotton work. The principal town is Harlech, which hath a pretty good market on Saturdays.

Montgomeryſhire is in compaſs 94 miles, and contains 560,000 acres. It is fruitful, though mountainous, and hath ſix ſmall market-towns, but no manufactures worth notice.

South Wales,

Contains Brecknockſhire, Cardiganſhire, and Caermarthenſhire, Glamorganſhire, Pembrokeſhire, and Radnorſhire.

Brecknockshire is 106 miles in circuit, and contains about 620,000 acres, divided into hills and valleys; the firſt but barren, but the latter very plentiful, wholeſome, and pleaſant. Brecknock is the chief town, and hath a good trade for clothing; it hath two good markets in a week, *viz.* Wedneſdays and Saturdays. The commodities are cattle, fiſh, and ſome ſmall quantities of otters fur.

Cardiganshire is 94 miles in compaſs, and contains about 520,000 acres. It is ſituated on the banks of the Iriſh ſea, and hath plenty of corn, cattle, fiſh, fowl, &c. Of late years it is become remarkable for its ſilver, copper, and lead mines.

Caermarthenshire is one of the moſt plentiful counties in all Wales; the air good, and the ſoil fertile. It affords plenty of corn, cattle, ſalmon, wood, pit-coal, and the beſt lead. It is 120 miles in compaſs, containing about 700,000 acres.

Glamorganshire is a very fine plentiful county; in the ſouth part it is ſo fruitful, that it is called, *The garden of Wales.* It is 112 miles in circuit, and contains about 540,000 acres. Cardiff is the county-town, which keeps two market-days weekly, *viz.* Wedneſday and Saturday.

Pembrokeshire is a very pleaſant and plentiful county, for the moſt part ſurrounded by the ſea. It is 93 miles in compaſs, and contains about 520,000 acres. This county is famous for a harbour, called Milford haven, which is juſtly eſteemed to be in all reſpects one of the beſt in the world. Pembroke is the principal town, whoſe market is kept on Saturday.

Radnorshire is one of the moſt barren and unfruitful counties in all Wales. It is in circuit 90 miles, and contains about 310,000 acres. The aſſizes are uſually kept at Preſtain, but Radnor is the ſhire-town, and hath a tolerable market upon Saturday, and Preſtain hath another on Wedneſday.

SCOTLAND,

IS ſituate on the north of England; the capital city is called Edinburgh: It is divided into the following ſhires or counties:

North

North of the Frith of Forth, are,

Fife	Chief towns.	St. Andrews
Monteith		Dumblane
Lenox		Dumbarton
Argyle		Inverary
Perth		Perth
Strathern		Abernethy
Breadalbane		
Lorn		Dumſtaffnage
Merns		Bervy
Angus		Dundee
Gowry		
Athole		Blair
Mar		Aberdeen
Badenoch		Ruthven
Lochaber		Innerlochy
Buchan		Peterhead
Bamff		Bamff
Murray		Elgin
Roſs		Tain
Sutherland		Dornock
Strathnaver		Strathy
Caithneſs		Wick

South of the Frith of Forth, are

Galloway	Chief towns.	Kirkcudbright
Nithſdale		Dumfries
Annandale		Annan
Eſkdale with Euſdale		
Liddeſdale		Hermitage
Tiviotdale		Jedburgh
The Merſe		Dunſe
Lauderdale		Lauder
Tweedale		Peebles
Clydeſdale		Glaſgow
Kyle		Air
Carrick		Bargenny
Lothian		Edinburgh
Stirling		Stirling
Renfrew		Renfrew
Cunningham		Irvin
Iſles of Bute		Rothſay
Iſles of Arran		
Peninſula of Cantire,		Kilkerran

To theſe may be added the Hebrides, or Weſtern Iſles, above 300 in number, the moſt conſiderable of which are Arran, Sky, and Mull: and the Iſles of Orkney and Shetland, northward, of each of which are many in number.

IRELAND,

IS a large iſland to the weſt of England and Scotland, the chief city of which is Dublin; it is divided into four provinces, which are again ſubdivided into the following counties:

Leinſter.	Louth	Chief towns.	Drogheda
	Dublin		Dublin
	Wicklow		Wicklow
	Wexford		Wexford
	Longford		Longford
	Meath		Mullingar
	King's county		Philipſton
	Queen's county		Maryborough
	Kilkenny		Kilkenny
	Kildare		Kildare
	Catherlough		Carlow
Ulſter.	Down	Chief towns.	Down
	Armagh		Armagh
	Monaghan		Monaghan
	Cavan		Cavan
	Antrim		Carrick-fergus
	Londonderry		Londonderry
	Tyrone		Dungannon
	Fermanagh		Inniſkilling
	Donnegal		Donnegal
Connaught.	Leitrim	Chief towns.	Leitrim
	Roſcommon		Athlone
	Gallway		Gallway
	Mayo		Mayo
	Sleigo		Sleigo
Munſter.	Tipperary	Chief towns.	Clonmel
	Waterford		Waterford
	Clare		Clare
	Limerick		Limerick
	Cork		Cork
	Kerry		Dingle

In St George's channel, almoſt equally diſtant from England, Scotland, and Ireland, is ſituated the Iſle of Man,

Man, the royalty of which, under the kings of Great Britain, was formerly in the family of the Stanleys, earls of Derby; but the male iſſue of that family being extinct, it was afterwards enjoyed by the duke of Athole, who is deſcended from the ſame, by a female branch; and being bought from him, is now annexed to the Crown.

The Britannic iſles above-deſcribed are ſeparated from France on the ſouth by the Engliſh channel; and from the Netherlands, Germany, Denmark, and Norway, by the German ocean, on the eaſt; the northern and weſtern ſides being waſhed by the ocean ſo called.

The Netherlands have Germany on the eaſt and north, the German ocean to the weſt, and France on the ſouth: They conſiſt of ſeventeen provinces; of which ten are ſubject to the houſe of Auſtria, and the remaining ſeven compoſe a republic called the *United Provinces*, inhabited by the Dutch, and are commonly called *Holland*, after the name of the moſt conſiderable of them; the names of the provinces, and their capitals follow:

Provinces.	Chief towns.
Holland	Amſterdam
Zealand	Middleburgh
Utrecht	Utrecht
Guelderland	Zutphen
Over-Iſſel	Deventer
Frieſland	Lewarden
Groningen	Groningen

The ten provinces are now commonly called the Auſtrian Netherlands, or Flanders, from the name of one of them; the names of the provinces, and their capitals follow:

Provinces.	Chief towns.
Gelderland	Gelders
Brabant	Bruſſels
Luxemburgh	Luxemburgh
Limburgh	Limburgh
Flanders	Bruges
Artois	Arras
Hainault	Mons
Namur	Namur
Marquiſ. of the emp.	Antwerp
Malines	Malines

The empire of Germany has on the eaſt ſide Pruſſia, Poland, and Hungary; the Baltic-ſea, Denmark, and the German-ocean, on the north; the Netherlands, and

part

part of France, on the weſt; and the Alps, which ſeparate it from Italy, on the ſouth.

This country is a large republic, whoſe chief officer is called the Emperor: he is elected by the nine electors, whoſe names, and principal cities, follow:

Electors.	Chief towns.
Archbiſhop of Mentz,	Mentz
Archbiſhop of Triers,	Triers
Archbiſhop of Cologne,	Cologne
Queen of Bohemia,	Prague
King of Pruſſia, as Marquis of Brandenburgh,	Berlin
King of Poland, as Duke of Saxony,	Dreſden
King of Gr. Britain, as D. of Brunſwick-Lunenburgh,	Hanover
Duke of Bavaria,	Munich
Count Palatine of the Rhine,	Manheim

There are great numbers of other dominions in Germany; but for brevity's ſake, we ſhall mention only,

	Chief towns.
The Archduchy of Auſtria,	Vienna
Landgraviate of Heſſe-Caſſel,	Caſſel
Duchy of Wirtemburgh,	Stutgard
Alſace, now ſubject to the French,	Straſburgh

There are alſo in Germany ſeveral free cities, which are ſo many ſmall commonwealths, under the protection of the Germanic body; ſuch as, Ratiſbon, Francfort, Hamburgh, &c. And among the Alps are other ſmall commonwealths, commonly known by the name of the Swiſs Cantons, the principal of which are Zurich, Bern, Baſil, and Friburgh; with theſe are confederated the republic of Geneva, and the leagues of the Griſons; all ſituated among thoſe mountains.

The kingdom of Hungary hath Poland on the north, Germany on the weſt, and on the other ſides the Turkiſh empire; the chief city is called Buda; other conſiderable cities are Preſburgh, Raab, Zygeth, Caniſia, Alba Regalis, Gran, Strigonium, Peſt, Temeſwaer, &c. all famous in hiſtory on account of the conteſts between the Chriſtians and Turks, for the ſovereignty of this kingdom.

It is at preſent under the dominion of Maria Thereſa, daughter of the late Emperor Charles VI. who is queen

of Hungary and Bohemia, archduchess of Auſtria, *&c.* and married Francis, late emperor of Germany, great duke of Tuſcany, *&c.*

Poland is a large elective kingdom, bounded on the eaſt by Crim Tartary and Muſcovy; on the north by part of Muſcovy and the Baltic ſea; on the weſt by Germany; and on the ſouth by Hungary, and part of Turkey: the capital city is called Warſaw.

Denmark and Norway, two kingdoms under the ſame ſovereign, are bounded on the north and weſt by the ocean, on the ſouth by part of Germany and the Baltic ſea, and on the eaſt by Sweden: the capital of Denmark is called *Copenhagen;* and that of Norway, *Bergen.*

Sweden has Denmark on the weſt, the Baltic ſea on the ſouth, Muſcovy on the eaſt, and the ocean on the north; the chief city is called *Stockholm.*

Muſcovy, or Ruſſia, hath part of Sweden and the Baltic ſea on the weſt, Poland and Crim Tartary on the ſouth, Great Tartary in Aſia on the eaſt, and the ocean on the north: The ancient capital is called Moſcow; but the reſidence of the court is now generally at Peterſburgh on the Baltic ſea. This empire is very extenſive, being near as big as all the reſt of Europe.

ASIA is ſeparated from Europe towards the north-weſt by the boundaries above deſcribed; towards the ſouth-weſt by the eaſtern part of the Mediterranean ſea; and by the iſthmus of Suez and the Red-ſea, which divide it from Africa; it is bounded on the ſouth by the Indian ocean, on the eaſt by the Pacific, and on the north by the northern or frozen ocean. Its dimenſions may be conceived from what follows: Holy Cape, on the northern ocean, in lat 72° 32′ N. long. 179° 45′ E. bears from the eaſtern point of Java, one of the Indian iſles, in lat. 8° 30′ S. long. 115° 55′ E. N. 28° 45′ E. diſtance 5540 miles. And Cape Ava, in the iſland of Japan, in the Pacific ocean, lat. 34° 45′ N. long. 141° 00′ E. bear, from Smyrna in the Archipelago, lat 48° 38′ N. long. 27° 25′ E. S. 87° 48′ E. diſtance 5530 miles.

It ſeems moſt regular to divide this large country according to its preſent poſſeſſors, the grand Seignior or emperor of the Turks, the Sophy or king of Perſia, the Great Mogul, and the other potentates of India, the emperor of China, and the potentates of Tartary.

The

The Turks poſſeſſions in Aſia are, Anatolia, Syria, Arabia, Armenia or Turcomania, Georgia, and Meſopotamia or Diarbec; of which in their order.

Anatolia, formerly called Aſia Minor, is encompaſſed on the north, weſt, and ſouth ſides, by the Euxine, the Marmorian, the Archipelago, and the Mediterranean ſeas; it is ſeparated from Syria on the ſouth-eaſt by the mountain called Taurus, and from Turcomania on the eaſt by the river Euphrates.

Its preſent ſubdiviſions are ſaid to be four; Anatolia Proper on the north weſt, its capital city Burſa; Amaſia on the north-eaſt, having a capital of the ſame name; Caramania on the ſouth weſt, its capital Cogni; and Aladuli on the ſouth-eaſt, its capital Maraz.

Syria, called by the Turks *Suriſtan*, is generally ſubdivided into Syria Proper, Phœnicia, and Paleſtine or Judea; whoſe chief cities are Aleppo, Damaſcus, and Jeruſalem.

Arabia (a country which preſerves its ancient name, as do the inhabitants their roaming diſpoſition) is bounded on the weſt by the Red ſea, and iſthmus of Suez; on the north by Paleſtine, Syria, and Diarbec; on the eaſt by the Perſian gulf; and on the ſouth eaſt by the Arabian ſea, a part of the Indian ocean.

It is divided into three parts, called the *Deſart*, the *Stony*, and the *Happy*; the two firſt lie to the northward, and the other to the ſouth.

There are very few towns in the deſart or ſtony parts of this country, the Arabs living in tents, and removing with their families from place to place, as profit or convenience ſuggeſt. But in Arabia the Happy, (one of the fineſt countries in the world) there are ſeveral of note, ſuch as, Medina, where the ſepulchre of Mahomet, the founder of the Turkiſh religion, is; Mecca, his birth place, to which every Turk or Muſſulman, is obliged, by that religion, to come in pilgrimage once in his life time, or to ſend another in his ſtead; Aden, a place of traffic; Sana, Mocha, Soar, and others.

Armenia or Turcomania, is bounded on the weſt by Anatolia, on the ſouth by Diarbec, on the eaſt and north by Georgia, and the Euxine ſea; its principal cities are Arſerum, Chars, and Van.

Georgia, formerly called Iberia, including Mingrelia, and Gurgeſtan, is bounded on the north by part of Muſcovy,

covy, on the weſt by the Euxine ſea; on the ſouth by Turcomania, and part of Perſia, and on the eaſt by part of Perſia; the cities of greateſt note are Faſſo and Teflis.

Meſopotamia or Diarbec is bounded on the north by Turcomania, on the weſt by Syria, on the ſouth by Arabia the deſart, and on the eaſt by Perſia: its principal cities are Diarbekir, Moſul, and Bagdat.

Beſides theſe large poſſeſſions, on the continent of Aſia, the Turks hold ſeveral iſlands in the Archipelago; with Rhodes and Cyprus in the Mediterranean ſea, the laſt of which is very conſiderable.

The next diviſion of Aſia, proceeding eaſtwardly, is Perſia, which has the Turkiſh dominions on the weſt, the Perſian gulf and part of the Indian ocean on the ſouth, the empire of the Great Mogul on the eaſt, and on the north, part of Tartary, the Caſpian ſea, and part of the Muſcovian empire.

This is a very large country, but at preſent torn to pieces by different competitors for the ſovereign power; the capital city is Iſpahan; the moſt conſiderable of the others are Derbent on the Caſpian ſea, and Gombroon, and Baſſora on the Perſian gulf.

Proceeding ſtill eaſtward, the next empire is that of the Great Mogul, which has Perſia on the weſt, the two Indian Peninſulas, and the bay of Bengal on the ſouth, China on the eaſt, and part of Tartary on the north.

This is another large tract, with the inland parts of which the Europeans are not much acquainted.

The principal cities are Agra, Lahor, Delhi, Cabul, and Caſimir: but whether Agra or Lahor is the capital, is difficult to determine, as authors do not agree concerning it; it is agreed, however, that the Mogul hath a magnificent palace at each of thoſe cities.

The maritime parts of the continent of India, are divided by the bay of Bengal, a branch of the Indian ocean, into two peninſulas, anciently called India within, or on this ſide the Ganges, and India without, or beyond the Ganges; beſides which two peninſulas, there are ſeveral large iſlands belonging to India; of which in their order.

The peninſula on this ſide the Ganges contains ſeveral diſtinct territories or kingdoms, moſt of which either are or were ſubject, or at leaſt tributary, to the Mogul; the

weſtern

weſtern ſide thereof is called the coaſt of Malabar, the eaſtern, the coaſt of Coromandel.

The coaſt of Malabar contains ſeveral European ſettlements; ſuch as, Bombay, an iſland belonging to the Engliſh Eaſt-India company, and Goa to the Portugueſe, at each of which they have the ſovereignty; and the Engliſh trade at leaſt, if they have not forts, at Gazurat, Surat, Calicut, and Cochin.

The iſland called Ceiland or Ceylon, by ſome called Zeloan, is ſituate a little to the eaſt of Cape Comorin, the moſt ſouthern point of this peninſula.

The coaſt of Coromandel, which is waſhed by the bay of Bengal, tends towards the north and north eaſt from Cape Comorin, and extends to the mouth of the Ganges; the principal ſettlements of the Engliſh on this coaſt are, Madraſs or Fort St George, and Fort St David, near which the French have a ſtrong ſettlement, called Pondicherry; which neighbouring ſettlements have for ſome time paſt been at war with each other, with various ſucceſs, the natives headed by their princes, called Nabobs, having taken part therein, ſome on one ſide, and ſome on the other.

The peninſula on the other ſide of the Ganges, conſiſts of the large kingdoms of Bengal, having a capital of the ſame name; Pegu, whoſe chief cities are Pegu and Aracan: Siam, having a capital of the ſame name; Malacca, ſituate to the ſouth, is almoſt compaſſed by the ſea, and the city ſo called is ſituate near the ſouthern extremity; Cochin-china, whoſe chief city is Cambodia; and Tonquin, whoſe capital is of the ſame name.

South-weſt of Malacca is the iſland of Sumatra.

South-eaſt of this lies the iſland of Java, ſeparated by the ſtraits of Sunda; the weſtern point of which is called Java-head, by Engliſh mariners, it being often the firſt land made by them after they have doubled the Cape of Good-Hope; the principal cities are Bantam and Batavia, the latter of which belongs to the Dutch Eaſt-India company, who are ſovereigns (or if not, yet act as ſuch) over the greateſt part of this large and fruitful iſland.

Eaſtward from Malacca and Sumatra is the iſland Borneo, almoſt round, and near 600 miles in diameter.

The iſland Celebes is to the eaſt of Borneo, and much leſs than it. Proceeding eaſtward are the Molucca or Spice

Spice iſlands: the Dutch have made themſelves maſters of theſe, and thereby engroſs the ſpice-trade to themſelves.

The Philippine iſles are very numerous, ſome authors having reckoned 10,000 of them; the moſt conſiderable is Luconia, whoſe capital is Manilla.

To the north and north-weſt of thoſe, is ſituated the potent empire of China, reckoned by ſome to be as big as all Europe: It hath the Pacific ocean on the eaſt and ſouth-eaſt, Cochin-china and Tonquin on the ſouth-weſt, the Mogul's empire on the weſt, and on the north-weſt and north e part of Tartary.

There are a great number of cities in this empire, of which Pekin, ſituated in the northern part of the country, is the capital; the European trade to this country is chiefly carried on at Canton, a great ſea-port in one of the ſouthern provinces.

The moſt conſiderable Chineſe iſlands are thoſe which compoſe the empire of Japan; which conſiſts of ſeveral large iſlands, three of which are very conſiderable, *viz.* Japan or Niphon, whoſe capital is Meaco; Tonſa, whoſe capital is Sanuqui; and Bongo, whoſe capital bears the ſame name.

Thus we have taken a curſory ſurvey of all the ſouthern parts of Aſia, the northern hath only one general name, *viz.* Tartary, which has Perſia, India, and China, on the ſouth, the Pacific ocean on the eaſt, the northern or frozen ocean on the north, and Muſcovy on the weſt; this large tract is ſubject to divers potentates, ſome of whom are very little known.

AFRICA is a large peninſula, which is joined to the continent of Aſia by the iſthmus of Suez, a narrow deſart between the Mediterranean and Red ſeas; its magnitude may be conceived, by knowing that the Cape of Good Hope in lat. 34° 15′ S. long. 20° 7′ E bears from Ceuta in lat. 35° 45′ N. long. 4° 42′ W. S. 18° 15′ E. diſtance 4440 miles; and that Cape Guarda-feu, in lat. 11° 48′ N. long. 50° 25′ E. bears from Cape Sierra Leone in lat. 8° 30′ N. long. 12° 7′ W. N. 87° 00′ E. diſtance 3700 miles.

Very little of the inland parts of this continent are known to the Europeans; ſo that only the ſea-coaſts will be mentioned here; beginning at the iſthmus of Suez, and coaſting firſt the Mediterranean ſea.

Egypt is under the dominion of the Turks; its preſent capital is called Cairo; the piratical ſtates of Tripoly, Tunis, and Algiers, have capitals of the ſame name; and the capital of the empire of Morocco is the city of Fez.

Along the coaſts of the Atlantic ocean, there are no extenſive dominions, the inhabitants being moſtly ſubject to petty princes of their own, who being almoſt continually at war with one another, ſell their priſoners for ſlaves: the European nations have been induced, for the protection of their trade therein, and other commodities, to erect ſeveral ſmall forts in different places, to enumerate which would be tedious: The Madieras, the Canaries, and the Cape de Verde iſlands, are the moſt conſiderable on this coaſt; the only one poſſeſſed by the Engliſh is a very ſmall one called St. Helena, frequented by the Eaſt India ſhips.

At the ſouthern extremity of this continent is ſituated the Cape of Good Hope, where the the Dutch Eaſt-India company have built a tolerable town, for the convenience of their ſhipping: from hence again, along the eaſtern coaſt, both on the ocean, and in the Red ſea, very little that is remarkable offers itſelf.

At ſome diſtance, however, from that part of this coaſt which is waſhed by the ocean, is ſituated one of the largeſt iſlands in the world, called Madagaſcar; which has been at different times the aſylum of European pirates.

AMERICA, by ſome called the new world, becauſe diſcovered about 300 years ago, being before that time unknown to the inhabitants of Europe, Aſia, and Africa, is divided into two remarkable diviſions, called North and South America, which are joined together by the iſthmus of Darien, or Panama.

The ſea-coaſt of North America, and part of the inland countries, formerly belonged to Britain, but is now under the dominion of the American States; the countries with their chief towns follow:

New England,	Chief towns.	Boſton,
New York,		New York,
Penſylvania,		Philadelphia,
New Jerſey, Eaſt,		Elizabeth-town,
New Jerſey, Weſt,		Elſingburgh,
Maryland,		Baltimore,

Virginia,

Virginia,	Chief towns.	James-town,	
North Carolina,		Edenton,	
South Carolina,		Charleſtown,	
Georgia,		Savannah,	

The Britiſh poſſeſs Nova Scotia, whoſe chief town is Halifax; Canada, whoſe capital city is Quebec, ſituate on the great river St Laurence; Newfoundland, a large iſland near the mouth of this river; and Cape Breton, a much ſmaller, but well fortified iſland.

The Spaniards poſſeſs the ſea-coaſt of Florida, the next ſouthern country, the principal ſettlements therein being St Auguſtine: the French have ſome ſettlements to the weſt of theſe along the river Miſſiſippi, which empties itſelf into the gulf of Mexico; the principal is Fort St Louis, from whence the country is called Louiſiana.

More to the ſouth-weſt is the empire of Mexico and its dependants, having a capital of the ſame name, ſubject to the Spaniards; this country extends itſelf weſtward to the Pacific ocean, and the Spaniards ſend ſhips yearly from Acapulco, a port therein, acroſs the ocean to the Philippine iſles in the Eaſt Indies.

Northward, on the Pacific ocean, is new Mexico, and the iſland of California; but we know little of theſe.

The continent of South America conſiſts of the following large diſtricts:

Terra Firma,	Chief towns.	Panama,	In the poſſeſſion of the	Spaniards.
Golden Caſtile,		Carthagena,		Spaniards.
Guiana,		Surinam,		Dutch.
Peru,		Lima,		Spaniards.
Chili,		St Jago,		Spaniards.
Patagonia,				Natives.
Terra del Fuego,				Natives.
La Plata,		Buenos Aires,		Spaniards.
Braſil,		St Salvadore,		Portugueſe
Paraguay,		Aſſumption		Jeſuits.
Amazonia,				Natives.

N. B. *Terra del Fuego is an iſland ſeparated from Patagonia, by the ſtraits of Magellan.*

The gulf of Mexico, Yuchatan, Honduras, and the Carribean ſea, are ſeparated from the Atlantic ocean by a great number of iſlands, called the Bahama, the greater and leſſer Antilles, and the Caribbee iſlands; the names of the moſt conſiderable are as follow:

	Chief towns.	Poſſeſſed by the
Cuba,	Havanna,	Spaniards.
Hiſpaniola, or St Domingo,	St Domingo,	French, and Spaniards.
Jamaica,	Port Royal,	Engliſh.
Porto Rico,	Porto Rico,	Spaniards.
Anguilla,		Engliſh.
Bermuda,		Engliſh.
St Chriſtopher's,		Engliſh.
Nevis,		Engliſh.
Antigua,		Engliſh.
Montſerrat,		Engliſh.
Barbadoes,		Engliſh.
Guadaloupe,	Bridge-town,	French.
Martinico,		French.
St Martin,		French.
Sancta Cruz,		French.
St Lucia,		Engliſh.

The iſlands called Bermudas, lying about 500 leagues eaſt of Florida, are ſubject to the Engliſh.

ASTRONOMY.

ASTRONOMY is a ſcience which treats of the motions and diſtances of the heavenly bodies, and of the appearances thence ariſing,

There have been a great variety of opinions among the philoſophers of the preceding age, concerning the diſpoſitions of the great bodies in the univerſe, or of the poſition of the bodies which appear in the heavens: but the notion now embraced by the moſt judicious aſtronomers is, that the univerſe is compoſed of an infinite number of ſyſtems of worlds; that in every ſyſtem there are certain bodies moving in a free ſpace, and revolving at different diſtances around a ſun, placed in or near the centre of the ſyſtem; and that theſe ſuns, or other bodies, are the ſtars which are ſeen in the heavens.

That ſyſtem in which our earth is placed, is by aſtronomers called the *ſolar ſyſtem*; and that opinion, which ſuppoſes the ſun to be fixed in or near the centre, with ſeveral bodies revolving round him, at different diſtances, is confirmed by all the obſervations hitherto made.

This opinion is alſo called the Copernican ſyſtem, from Nicholas Copernicus, a Poliſh philoſopher, who about

bout the year 1473, revived this notion from the oblivion it had been buried in for many ages.

The ſun therefore is placed in the midſt of an immenſe ſpace, wherein ſix opaque ſpherical bodies revolve about him as their centre.

Theſe wandering globes are called planets, which at different diſtances, and in different periods, perform their revolutions from weſt to eaſt, in the following order:

I. Mercury is neareſt to the ſun of all the planets, and performs its courſe in about 3 months, or 87 days 23 hours. II. Venus, in about 7 months and a half, or 224 days 17 hours. III. The Earth, in a year or 365 days 6 hours. IV. Mars, in about 2 years, or 686 days 23 hours. V. Jupiter in 12 years, or 4232 days 12 hours. VI. and laſtly, Saturn, whoſe orbit * includes all the reſt, ſpends almoſt 30 years, that is 10759 days 8 hours, in one revolution round the ſun. The diſtances of the planets from the ſun are nearly in the following proportion, *viz.* ſuppoſing the diſtance of the earth from the ſun to be divided into 1000 equal parts; Mercury will be about 387 of thoſe parts; Venus 724; Mars 1524; Jupiter 5201; and Saturn 9538.

The orbits of the planets are not all in the ſame plane, but variouſly inclined to one another; ſo that, ſuppoſing the orbit of the earth to be the ſtandard, the others will have one half above, and the other half below it: interſecting one another in a line paſſing through the ſun.

The plane of the earth's orbit is called the ecliptic; and this the aſtronomers make the ſtandard, to which the planes of the other orbits are judged to incline.

The right line paſſing through the ſun, and the common interſections of the plane of the orbit of any planet with the ecliptic, is called the line of the nodes of that planet; and the points themſelves, wherein the orbit cuts the ecliptic, are called the nodes.

The inclinations of the orbits of the planets to the plane of the ecliptic, are as follows, *viz.* the orbit of Mercury makes an angle of 6° 52′; that of Venus 3° 23′; of Mars 1° 52′; of Jupiter 1° 20′; and of

* *By the orbit of a planet, is commonly underſtood the track or ring deſcribed by its centre round the ſun; but by the plane of the orbit is meant a flat ſurface, extended every way through the orbit infinitely.*

Saturn 2° 20′. The orbits of the planets are not circles, but ellipſes or ovals.

What an ellipſis is, may be eaſily underſtood from the following deſcription: Imagine two ſmall pegs fixed upright on any plane, and ſuppoſe them tied with the ends of a thread, ſomewhat longer than their diſtance from one another; now if a pin be placed in the double of the thread, and turned quite round, (always ſtretching the thread with the ſame force) the curve deſcribed by the motion will be an ellipſis. The two points where the pegs ſtood, about which the thread was turned, are called the focuſes or foot of that ellipſis; and if without changing the length of the thread, we alter the poſition of the pegs, we ſhall then have an ellipſis of a different kind from the former; and the nearer the focuſes are together, the nearer will the curve deſcribed be to a circle; until at laſt the two focuſes coincide, and then the pin in the doubling of the thread will deſcribe a perfect circle.

The orbits of all the planets have the ſun in one of their focuſes, and half the diſtance between the two focuſes is called the excentricity of the orbits. This excentricity is different in all the planets, but in moſt of them it is ſo ſmall, that in little ſchemes or inſtruments, made to repreſent the planetary orbits, it need not be conſidered.

If as before we ſuppoſe the mean diſtance of the earth from the ſun to be divided into 1000 parts; then will the excentricity of Mercury be 81 of thoſe parts, that of Venus 5, that of the Earth 17, that of Mars 141, that of Jupiter 240, and that of Saturn 543 of the ſame parts.

The ſix planets above-mentioned are called primaries, or primary planets; but beſides theſe, there are ten other leſſer planets, which are called ſecondaries, moons, or ſatellites. Theſe moons always accompany their reſpective primaries, and perform their revolutions round them, while both together are alſo carried round the ſun.

Of the ſix primary planets, there are but three, as far as obſervation can aſſure us, that have theſe attendants, *viz.* the Earth, Jupiter, and Saturn.

The Earth is attended by the Moon, who performs her revolutions in about 29½ days, at the diſtance of about

about 30 diameters of the Earth from it; and once a-year is carried round the Sun along with the Earth.

Jupiter has four moons or ſatellites; the firſt or innermoſt performs its revolution in about one day and 18½ hours, at the diſtance of 5½ ſemidiameters of Jupiter from his center; the ſecond revolves about Jupiter in 3 days and 13 hours, at the diſtance of 9 of his ſemidiameters; the third in 7 days 4 hours, at the diſtance of 14½ ſemidiameters; the fourth and outermoſt performs its courſe in the ſpace of 16 days 18 hours, and its diſtance from Jupiter's centre is 25½ of his ſemidiameters.

Saturn has no leſs than 5 ſatellites; the firſt or innermoſt revolves about him in 1 day and 21 hours, at the diſtance of 4⅜ diameters of Saturn from his centre; the ſecond completes his period in 2¾ days, at the diſtance of 5½ diameters; the third in about 4½ days, at the diſtance of 8 diameters; the fourth performs its courſe in about 16 days, at the diſtance of 18 diameters; the fifth and outermoſt, takes 79½ days to finiſh his courſe, and is 54 diameters of Saturn diſtant from his centre. The ſatellites, as well as the primaries, perform their revolutions from weſt to eaſt; the planes of the orbits of the ſatellites of the ſame planet, are variouſly inclined to one another, and conſequently are inclined to the plane of of the orbit of their primary.

Beſides theſe attendants, Saturn is encompaſſed with a thin ring, that does no where touch his body: the diameter of this ring is to the diameter of Saturn, as 9 to 4; and the void ſpace between the ring and the body of Saturn, is equal to the breadth of the ring itſelf; ſo that, in ſome ſituations, the heaven may be ſeen between the ring and his body.

This ſurpriſing phenomenon of Saturn's ring is a modern diſcovery; neither were the ſatellites of Jupiter and Saturn known to the ancients; the Joval planets were firſt diſcovered by the famous, Italian philoſopher, Galilæus, by a teleſcope which he firſt invented; and the celebrated Caſſini, the French king's aſtronomer, was the firſt that ſaw the ſatellites of Saturn; which by reaſon of their great diſtances from the ſun, and the ſmallneſs of their own bodies, cannot be ſeen by us but by the help of very good glaſſes.

The motion of the primary planets round the ſun (as alſo of the ſatellites round their reſpective primaries) is

called

called their annual motion: becauſe they have one year, or the alterations of the ſeaſons, complete in one of thoſe revolutions. Beſides this annual motion, four of the planets, *viz.* Venus, the Earth, Mars, and Jupiter, revolve about their own axes, from weſt to eaſt; and this is called their diurnal motion. For by this rotation each point of their ſurface is carried ſucceſſively towards or from the ſun, who always illuminates the hemiſphere which is next to him, the other remaining obſcure; and while any place in the hemiſphere is illuminated by the ſun, it is day; but when it is carried to the obſcure hemiſphere, it becomes night; and ſo continues, until, by this rotation, the ſaid place is again enlightened by the ſun.

The Earth performs its revolution round its axis in 23 hours 56 minutes; Venus in 23 hours; Mars in about 24 hours and 40 minutes; and Jupiter moves round his own axis in 9 hours and 56 minutes.

The ſun is alſo found to turn round his axis from weſt to eaſt in 27 days; and the moon, which is neareſt to us of all the planets, revolves about her axis in a month, or in the ſpace of time that ſhe turns round the earth, ſo that the Lunarians have but one day throughout their year.

The planets are all opaque bodies, having no light but what they borrow from the ſun; for that ſide of them which is next towards the ſun, has always been obſerved to be illuminated, in what poſition ſoever they be; but the oppoſite ſides which the ſolar rays do not reach, remain dark and obſcure; whence it is evident, that they have no light but what proceeds from the ſun: for if they had, all parts of them would be lucid, without any darkneſs or ſhadow. The planets are likewiſe proved to be globular, becauſe, let what part of them ſoever be turned toward the ſun, its boundary, or line ſeparating that part from the oppoſite, always appears to be circular; which could not happen if they were not globular.

The earth is placed betwixt the orbs of Mars and Venus: and Mercury, Venus, Mars, Jupiter, and Saturn, do all turn round the ſun; both which may be proved from obſervations, as follow:

1. Whenever Venus is in conjunction with the ſun, that is, when ſhe is in the ſame direction from the earth, or towards the ſame part of the heavens the ſun is in; ſhe either appears with a bright and round face, like a full

full moon, or elſe diſappears; or, if ſhe is viſible, ſhe appears horned, like a new moon; which phenomena could never happen, if Venus did not turn round the ſun, and was not betwixt him and the earth; for ſince all the planets borrow their light from the ſun, it is neceſſary that Venus's lucid face ſhould be towards the ſun; and when ſhe appears fully illuminated, ſhe ſhews the ſame face to the ſun and the earth; whence, at that time, ſhe muſt be above or beyond the ſun, for in no other poſition could her illuminated face be wholly ſeen from the earth. Farther, when ſhe diſappears, or, if viſible, appears horned, that face of hers which is towards the ſun, is either wholly turned from the earth, or only a ſmall part of it can be ſeen by the earth; and in this caſe, ſhe muſt of neceſſity be betwixt us and the ſun.

Beſides the foregoing, there is another argument to prove that Venus turns round the ſun in an orbit that is within the earth's; becauſe ſhe is always obſerved to keep near the ſun, and in the ſame quarter of the heavens that he is in, never receding from him more than about $\frac{1}{3}$ of a whole circle, and therefore ſhe can never come in oppoſition to him; which would neceſſarily happen, did ſhe perform her courſe round the earth either in a longer or ſhorter time than a year.

And this is the reaſon why Venus is never to be ſeen near midnight, but always either in the morning or evening, and at moſt not above three or four hours before ſun-riſing or after ſun-ſetting. From the time of Venus's ſuperior conjunction (or when ſhe is above the ſun) ſhe is more eaſterly than the ſun, and therefore ſets later, and is ſeen after ſun-ſetting, and then ſhe is commonly called the Evening ſtar: but from the time of her inferior conjunction, till ſhe comes again to the ſuperior, ſhe then appears more weſterly than the ſun, and is only to be ſeen in the morning, before ſun-riſing, and is then called the Morning-ſtar.

After the ſame manner we prove that Mercury turns round the ſun, for he always keeps in the ſun's neighbourhood, and never recedes from him ſo far as Venus does; and therefore the orbit of Mercury muſt lie within that of Venus; and on account of his nearneſs to the ſun, he can ſeldom be ſeen without a teleſcope.

Mars is obſerved to come in oppoſition, and likewiſe to have all other aſpects with the ſun; he always preſerves

ſerves a round, full, and bright face, except when he
near his quadrate aſpect, when he appears ſomewha
gibbous, like the moon three or four days before or afte
the full; therefore the orbit of Mars muſt include th
earth within it, and alſo the ſun; for if he was betwix
the ſun and us, at the time of his inferior c njunctio
he would either quite diſappear, or appear horned, a
Venus and the moon do in that poſition.

Mars, when he is in oppoſition to the ſun, looks almo
ſeven times larger in diameter, than when he is in con
junction with him; and therefore muſt needs be almo
ſeven times nearer to us, in one poſition, than in th
other: for the apparent magnitudes of far diſtant ob
jects increaſe or decreaſe, in proportion to their diſtance
from us; but Mars keeps always nearly at the ſame diſ
tance from the ſun: therefore it is plain, that it is no
the earth, but the ſun, which is the centre of his mo
tion.

It is proved, in the ſame way, that Jupiter and Saturn
have both the ſun and earth within their orbits; and that
the ſun, and not the earth, is the centre of their motions;
although the diſproportion of the diſtances from the
earth is not ſo great in Jupiter, as in Mars, nor ſo great
in Saturn as it is in Jupiter, by reaſon that they are at a
much greater diſtance from the ſun.

We have now ſhewn, that all the planets turn round
the ſun, and that Mercury and Venus are included be-
tween him and the earth; whence they are called the
inferior planets; and that the earth is placed between
the orbits of Mars and Venus, and therefore included
between the orbits of Mars, Jupiter, and Saturn; whence
they are called the ſuperior planets; and ſince the earth
is in the middle of theſe moveable bodies, and is of the
ſame nature with them, we may conclude, that ſhe has
the ſame ſort of motions. But that ſhe turns round the
ſun is proved thus:

All the planets ſeen from the earth appear to move
very unequally; as ſometimes to go faſter, at other times
ſlower, and ſometimes to be ſtationary, or not to move
at all; which could not happen if the earth ſtood ſtill.

The annual periods of the planets round the ſun are
determined, by carefully obſerving the length of time
ſi ice their departure from a certain point in the heavens,
or from a fixed ſtar, until they arrive to the ſame again.

By

By theſe ſort of obſervations, the ancients determined the periodical revolutions of the planets round the ſun; and were ſo exact in their computations, as to be capable of predicting eclipſes of the ſun and moon; but ſince the invention of teleſcopes, aſtronomical obſervations are made with greater accuracy, and of conſequence our tables are far more perfect than thoſe of the ancients.

And in order to be as exact as poſſible, aſtronomers compare obſervations made at a great diſtance of time from one another, including ſeveral periods; by which means the error that might be in the whole, is in each period ſubdivided into ſuch little parts, as to be very inconſiderable. Thus, the mean length of a ſolar year is known even to ſeconds.

The diurnal rotation of the planets round their axes was diſcovered by certain ſpots which appear on their ſurfaces; theſe ſpots firſt appear on the margin of the planets diſks, (or the edge of their ſurfaces) and ſeem by degrees to creep towards the middle; and ſo on, going ſtill forward, till they come to the oppoſite ſide or edge of the diſk, where they ſet or diſappear; and after they have been hid for the ſame ſpace of time that they were viſible, they again appear to riſe in or near the ſame place they did at firſt; then to creep on progreſſively, taking the ſame courſe as they did before. Theſe ſpots have been obſerved on the ſurfaces of the Sun, Venus, Mars, and Jupiter; by which means it has been found, that theſe bodies turn round their own axes, in the times before-mentioned.

It is very probable, that Mercury and Saturn have likewiſe a motion round their axes, that all the parts of their ſurface may alternately enjoy the light and heat of the ſun, and receive ſuch changes as are proper and convenient for their nature; but by reaſon of the nearneſs of Mercury to the ſun, and Saturn's immenſe diſtance from him, no obſervations have hitherto been made, whereby their ſpots, if they have any, could be diſcovered, and therefore their diurnal motions cannot be determined. The diurnal motion of the earth is concluded to exiſt from the apparent revolution of the heavens, and of all the ſtars round it, in the ſpace of a natural day. For it is much eaſier to conceive that this, comparatively ſmall globe ſhould turn round its own axis, once in 24 hours, than that ſuch a great number of much larger bodies,

ſome

ſome of them ſo immenſely diſtant, ſhould revolve round it in ſo ſhort a ſpace of time. The ſolar ſpots do not always remain the ſame, but ſometimes old ones vaniſh and afterwards others ſucceed in their room; ſometimes ſeveral ſmall ones gather together, and make one large ſpot; and ſometimes a large ſpot is ſeen to be divided into many ſmall ones. But notwithſtanding theſe changes they all turn round with the ſun in the ſame time.

Each planet is obſerved always to paſs through the conſtellations Aries, Taurus, Gemini, Cancer, Leo, Virgo; Libra, Scorpio, Sagittarius, Capricornus, Aquarius, Piſces; and it alſo appears, that every one has a track peculiar to itſelf; whereby the paths of the ſix planets form among the ſtars a kind of road, which is called the Zodiac: the middle part whereof, called the Ecliptic is the orbit deſcribed by the earth, with which the orbits of the other planets are compared.

As the ecliptic runs through twelve conſtellations, it is ſuppoſed to be divided into twelve equal parts, of 30 degrees each, called ſigns, having the ſame names with the twelve conſtellations they run through.

The plane of the ecliptic is ſuppoſed to divide the celeſtial ſphere into two equal parts, called the northern and ſouthern hemiſpheres; and a body ſituate on either of theſe hemiſpheres is ſaid to have north or ſouth latitude, according to the hemiſphere it is in; ſo that latitude of a celeſtial object is its neareſt diſtance from the ecliptic.

The planes of the other five orbits are obſerved to lie partly in the northern, and partly in the ſouthern hemiſphere; ſo that every one, cuts the ecliptic in two oppoſite points called, Nodes; one, called the aſcending node, is that through which the planet paſſes, when it moves out of the ſouthern into the northern hemiſphere; and the other called the deſcending node, is that through which the planet muſt paſs in going out of the northern into the ſouthern hemiſphere.

The right line joining the two nodes of any planet, is called the line of the nodes.

The names to moſt of the conſtellations were given by the ancient aſtronomers, who reckoned that ſtar in Aries now marked ♈, (according to Bayer) to be the firſt point in the ecliptic, this ſtar being next the ſun when he entered the vernal equinox, and at that time each conſtella-

tion

tion was in the ſign by which it was called: but obſervations ſhew, that the point marked in the heavens by the vernal equinox has been conſtantly going backwards by a ſmall quantity every year; whereby the ſtars appear to have advanced as much forwards, ſo that the conſtellation Aries is now almoſt removed into the ſign Taurus; the ſaid firſt ſtar in Aries being got almoſt 30 degrees forwards from the equinox; which difference is called the Proceſſion of the equinoxes, whereof the yearly alteration is about 50 ſeconds of a degree, or about a degree in 72 years.

All the planets have one common focus, in which the ſun is placed: for as no other ſuppoſition can ſolve all the appearances that are obſerved in the motion of the planets, and as it alſo agrees with the ſtricteſt phyſical and mathematical reaſoning; therefore it is now received as an elementary principle.

The line of the nodes of every planet paſſes through the ſun; for as the motion of every planet is in a plane paſſing through the ſun, conſequently the interſections of theſe planes, that is, the lines of the nodes, muſt alſo paſs through the ſun.

All the planets in their revolutions are ſometimes nearer, ſometimes farther from the ſun: This is a conſequence of the ſun not being placed in the centre of each orbit, the orbits being ellipſes.

The aphelion, or ſuperior apſis, is that point of the orbit which is fartheſt diſtant from the ſun; and the perihelion, or inferior apſis, is that point which is neareſt the ſun; and the tranſverſe diameter of the orbit, or the line joining the two apſes, is called the line of the apſes or apſides.

The planets move faſter as they approach the ſun, or come nearer to the perihelion, and ſlower as they recede from the ſun, or come nearer the aphelion: this is not only a conſequence from the nature of the planets motions about the ſun, but is confirmed by all good obſervations.

If a right line be drawn from the ſun, through any planet, (which line is called by ſome the *vector radius*) and be ſuppoſed to revolve round the ſun with the planet, then this line will deſcribe or paſs through every part of the plane of the orbit. ſo that the *vector radius* may be ſaid to deſcribe the area of the orbit.

There are two chief laws obſerved in the ſolar ſyſtem, which regulates the motions of all the planets: namely,

I. The planets deſcribe equal areas in equal times; that is, in equal proportion of time; the vector radius deſcribes the equal areas or portions of the ſpace contained within the planet's orbit.

II. The ſquares of the periodical times of the planets are as the cubes of the mean diſtance from the ſun; that is, as the ſquare of the time which a planet *A*, takes to revolve in its orbit, is to the ſquare of the time taken by any other planet *B*, to run through its orbit; ſo is the cube of the mean diſtance of *A* from the ſun to the cube of the mean diſtance of *B* from the ſun.

The mean diſtance of a planet from the ſun is its diſtance from him, when a planet is at either extremity of the conjugate diameter; and is equal to half of the tranſverſe diameter,

The foregoing laws are the two famous laws of Kepler, a great aſtronomer, who flouriſhed in Germany, about the beginning of the 17th century, and who deduced them from a multitude of obſervations; but the firſt who demonſtrated theſe laws was the incomparable Sir Iſaac Newton.

By the ſecond law, the relative diſtances of the planets from the ſun are known, and was the real diſtance of any one known, the abſolute diſtances of all the others would thereby be obtained.

Beſides the planets already mentioned, there are other great bodies that ſometimes viſit our ſyſtem, which are a ſort of temporary planets; for they come and abide with us for a while, and afterwards withdraw from us, for a certain ſpace of time, after which they again return. Theſe wandering bodies are called Comets.

The motions of the comets in the heavens, according to the beſt obſervations hitherto made, ſeems to be regulated by the ſame immutable law with the planets; for their orbits are elliptical, like thoſe of the planets, but vaſtly narrower, or more excentric. Yet they have not all the ſame direction with the planets, who move from weſt to eaſt, for ſome of the comets move from eaſt to weſt; and their orbits have different inclinations to the earth's orbit; ſome inclining northwardly, others ſouthwardly, much more than any of the planetary orbits do.

Although

Although both the comets and the planets move in elliptic orbits, yet their motions ſeem to be vaſtly different: for the excentricities of the planets orbits are ſo ſmall, that they differ but little from circles; but the excentricities of the comets are ſo very great, that the motions of ſome of them ſeem to be almoſt in right lines, tending directly towards the ſun.

Now, ſince the orbits of the comets are ſo extremely excentric, their motions, when they are in their perihelia, or neareſt diſtance from the ſun, muſt be much ſwifter, than when they are in their aphelia, or fartheſt diſtance from him; which is the reaſon why the comets make ſo ſhort a ſtay in our ſyſtem; and, when they diſappear, are ſo long in returning.

The figures of the comets are obſerved to be very different; ſome of them ſend forth ſmall beams, like hair, every way round them; others are ſeen with a long fiery tail, which is always oppoſite to the ſun. Their magnitudes are alſo very different; but in what proportion they exceed each other, is as yet uncertain. Nor is it probable that their numbers are yet known, for they have not been obſerved with due care, nor their theories diſcovered, but of late years. The ancients were divided in their opinions concerning them; ſome imagined that they were only a kind of meteors kindled in our atmoſphere, and were there again diſſipated; others took them to be ſome ominous prodigies. But modern diſcoveries prove, that they are worlds, ſubject to the ſame laws of motion as the planets are: and they muſt be very hard and durable bodies, elſe they could not bear the vaſt heat, which ſome of them, when in their perihelia, receive from the ſun, without being utterly conſumed. The great comet which appeared in the year 1680, was within $\frac{1}{6}$ part of the ſun's diameter from his ſurface; and therefore its heat muſt be prodigiouſly intenſe beyond imagination: and when it is at its greateſt diſtance from the ſun, the cold muſt be as rigid.

The fixed ſtars are thoſe bright and ſhining bodies, which, in a clear night, appear to us every where diſperſed through the boundleſs regions of ſpace. They are termed Fixed, becauſe they are found to keep the ſame immutable diſtance, in all ages, without having the motions obſerved in the planets. The fixed ſtars are all placed at ſuch immenſe diſtance from us, that the beſt

of teleſcopes repreſent them no bigger than points, without having any apparent diameters.

It is evident from hence, that all the ſtars are luminous bodies, and ſhine with their own proper and native light, elſe they could not be ſeen at ſuch a great diſtance. For the ſatellites of Jupiter and Saturn, though they appear under conſiderable angles, through good teleſcopes, yet are altogether inviſible to the naked eye.

Although the diſtance betwixt us and the ſun is vaſtly large, when compared to the diameter of the earth, yet it is nothing, when compared with the prodigious diſtance of the fixed ſtars; for the whole diameter of the earth's annual orbit appears, from the neareſt fixed ſtar, no bigger than a point, and the fixed ſtars are at leaſt 100,000 times farther from us than we are from the ſun; as may be demonſtrated from the obſervations of thoſe who have endeavoured to find the parallax of the earth's annual orbit, or the angle under which the earth's orbit appears from the fixed ſtars.

Hence it follows, that though we approach nearer to ſome fixed ſtars at one time of the year than we do at the oppoſite, and that by the whole length of the diameter of the earth's orbit; yet this diſtance being ſo ſmall in compariſon with the diſtance of the fixed ſtars, their magnitudes or poſitions cannot thereby be ſenſibly altered. Therefore we may always, without error, ſuppoſe ourſelves to be in the ſame center of the heavens, ſince we have always the ſame viſible proſpect of the ſtars without any alteration.

If a ſpectator was placed as near to any fixed ſtar, as we are to the ſun, he would there obſerve a body as big, and every way like, as the ſun appears to us; and our ſun would appear to him no bigger than a fixed ſtar; and undoubtedly he would reckon the ſun one of them, in numbering the ſtars. Wherefore, ſince the ſun differeth in nothing from a fixed ſtar, the fixed ſtars may be reckoned as ſo many ſuns.

It is not reaſonable to ſuppoſe, that all the fixed ſtars are placed at the ſame diſtance from us; but it is more probable that they are every where interſperſed through the vaſt indefinite ſpace of the univerſe; and that there may be as great a diſtance between any two of them, as there is betwixt our ſun and the neareſt fixed ſtar. Hence it follows, why they appear to us of different magnitudes,

not

not becauſe they really are ſo, but becauſe they are at different diſtances from us; thoſe that are neareſt excelling in brightneſs and luſtre thoſe that are more remote, which give a fainter light, and appear ſmaller to the eye.

The aſtronomers diſtribute the ſtars into ſeveral orders, or claſſes: Thoſe that are neareſt to us, and appear brighteſt to the eye, are called ſtars of the firſt magnitude; thoſe that are neareſt to them in bigneſs and luſtre, are called ſtars of the ſecond magnitude; thoſe of the third claſs, are ſtyled ſtars of the third magnitude; and ſo on, until we come to the ſtars of the ſixth magnitude, which are the ſmalleſt that can be diſcerned by the naked eye. There are infinite numbers of ſmaller ſtars, that can be ſeen through teleſcopes; but theſe are not reduced to any of the ſix orders, and are only called teleſcopic ſtars. It may be here obſerved, that though the aſtronomers have reduced all the ſtars that are viſible to the naked eye, into ſome one or other of theſe claſſes; yet we are not to conclude from hence, that all theſe ſtars anſwer exactly to ſome or other of theſe orders, but there may be in reality as many orders of the ſtars as they are in number, few of them appearing of the ſame bigneſs and luſtre.

The ancient aſtronomers, that they might diſtinguiſh the ſtars, in regard to their ſituation and poſition to each other, divided the whole ſtarry firmament into ſeveral aſteriſms or ſyſtems of ſtars, conſiſting of thoſe that are near to one another. Theſe aſteriſms are called Conſtellations, and are digeſted into the forms of ſome animals, as men, lions, bears, ſerpents, *&c.* or to the images of ſome known things, as a crown, a harp, a triangle, *&c.*

The ſtarry firmament was divided by the ancients into 48 images or conſtellations; twelve of which they placed in that part of the heavens wherein are the planes of the planetary orbits; which part is called the zodiac, becauſe moſt of the conſtellations placed therein reſemble ſome living creature. The two regions of the heavens on each ſide of the zodiac, are called the north and ſouth parts of the heavens.

The conſtellations within the zodiac are, 1. Aries, the Ram; 2. Taurus, the Bull; 3. Gemini, the Twins; 4. Cancer, the Crab; 5. Leo, the Lion; 6. Virgo, the

Virgin; 7. Libra, the Balance; 8. Scorpio, the Scorpion; 9. Sagittarius, the Archer; 10. Capricornus, the Goat; 11. Aquarius the Water-bearer; and, 12. Piſces, the Fiſhes.

The conſtellations on the north ſide of the zodiac are thirty-ſix, *viz.* the Little Bear; the Great Bear; the Dragon; Cæpheus, a king of Ethiopia; the Greyhounds; Bootes; the keeper of the Bear; Mons Menelaus; Berenice's hair; Charles's heart; the Northern Crown; Hercules with his club, watching the dragon; Cerberus; the Harp; the Swan; the Fox; the Gooſe; the Lizard; Caſſiopeia; Perſeus; Andromeda, the great Triangle; the Little Triangle; Auriga; Pegaſus, or the Flying Horſe; the Dolphin; the Arrow; the Eagle, Serpentarius, the Serpent; Sobieſki's Shield; Camelopardus; Antinous; the Colt; the Lynx; the Little Lion; and Muſca.

The conſtellations noted by the ancients on the ſouth ſide of the zodiac were, the Whale, the river Eridanus, the Hare, Orion, the Great Dog, the Little Dog, the Ship Argo, Hydra, the Centaur, the Cup, the Crow, the Wolf, the Altar, the Southern Crown, and the Southern Fiſh. To theſe have been lately added the following, *viz.* the Phœnix, the Crane, the Peacock, Noah's Dove, the Indian, the Bird of Paradiſe, Charles's Oak, the Southern Triangle, the Fly or Bee, the Swallow, the Chameleon, the Flying Fiſh, Toucan, or the American Gooſe, the Water-ſerpent, and the Sword-fiſh.

The ancients placed theſe particular conſtellations or figures in the Heavens, either to commemorate the deeds of ſome great man, or of ſome notable exploit or action; or elſe took them from the fables of their religion, &c. And the modern aſtronomers do ſtill retain them, to avoid the confuſion that would ariſe by making new ones, when they compare the modern obſervations with the old ones.

Some of the principal ſtars have particular names given them, as Syrius, Arcturus, &c. There are alſo ſeveral ſtars that are not reduced into conſtellations, and theſe are called unformed ſtars.

Beſides the ſtars viſible to the naked eye, there is a very remarkable ſpace in the heavens, called the Galaxy, or Milky-way; this is a broad circle of a whitiſh hue like milk, going quite round the whole heavens; and conſiſting

conſiſting of an infinite number of ſmall ſtars, viſible through a teleſcope, though not diſcernible by the naked eye, by reaſon of their exceeding faintneſs; yet with their light, they combine to illuſtrate that part of the heavens where they are, and to cauſe that ſhining whiteneſs.

The places of the fixed ſtars, or their relative ſituations one from another, have been carefully obſerved by aſtronomers, and digeſted into catalogues. The firſt among the Greeks, who reduced the ſtars into a catalogue, was Hipparchus, who, from his own obſervations, and of thoſe who lived before him, inſerted 1022 ſtars into his catalogue about 120 years before the Chriſtian æra; this catalogue has been ſince enlarged and improved, by ſeveral learned men, to the number of 3000, of which there are a great many teleſcopical, and not to be diſcerned by the naked eye; and theſe are all ranked in the catalogue as ſtars of the ſeventh magnitude.

It may ſeem ſtrange to ſome, that there are no more than this number of ſtars viſible to the naked eye; for ſometimes in a clear night, they ſeem to be innumerable. But this is only a deception of our ſight, (ariſing from their vehement ſparkling, while we look upon them confuſedly, without reducing them into any order) for there can ſeldom be ſeen above 1000 ſtars in the whole heavens, with the naked eye, at the ſame time; and if we ſhould diſtinctly view them, we ſhall not find many but what are inſerted upon a good celeſtial globe.

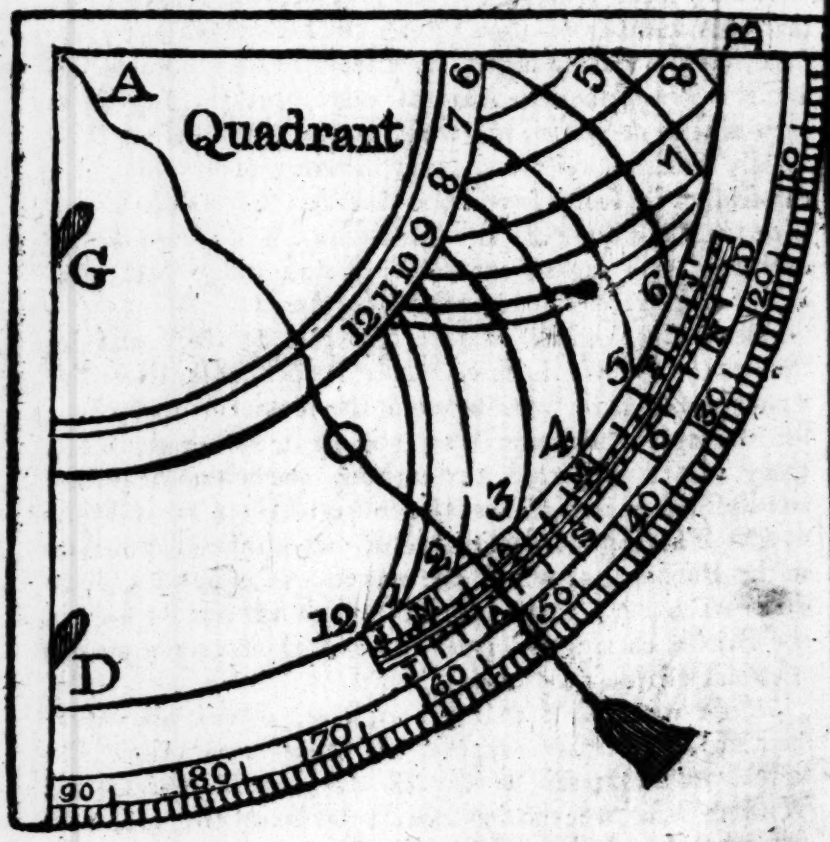
Altho' the number of ſtars that can be diſcerned by the naked eye are ſo few, yet it is probable there are many more, which are beyond the reach of our optic; for through teleſcopes they appear in vaſt multitudes, every where diſperſed throughout the whole heavens; and the better our glaſſes, the more of them we ſtill diſcover. The ingenious Dr Hook has obſerved 78 ſtars in the Pleiades, of which the naked eye is never able to diſcern above 7: and in Orion, which has but 80 ſtars in the Britiſh catalogue, (and ſome of them teleſcopical,) there have been numbered 2000 ſtars.

Thoſe who think that all theſe glorious bodies were created for no other purpoſe, than to give us a little dim light, muſt entertain a very ſlender idea of the Divine Wiſdom; for we receive more light from the moon itſelf, than from all the ſtars put together.

And

And ſince the planets are ſubject to the ſame laws of motion with our earth, and ſome of them not only equal to, but vaſtly exceed it in magnitude, it is not unreaſonable to ſuppoſe, that they are all habitable worlds. And ſince the fixed ſtars are nowiſe behind our ſun, either in bigneſs or luſtre; is it not probable, that each of them have a ſyſtem of planetary worlds turning round them, as we do round our ſun? And if we aſcend as far as the ſmalleſt ſtar we can ſee, ſhall we not then diſcover innumerable more of the glorious bodies, which now are altogether inviſible to us? And ſo *ad infinitum* through the boundleſs ſpace of the univerſe. What a magnificent idea muſt this raiſe in us of the Divine Being! who is every where, and at all times preſent, diſplaying his divine power, wiſdom, and goodneſs, amongſt all his creatures.

I proceed to ſay ſomething in relation to the uſe of a very neceſſary inſtrument, called a Quadrant, the ſhape of which is here preſented:



The

The quadrant, or quarter of a circle, is variouſly uſeful, on ſundry accounts, *viz.* to take heights and diſtances, whether acceſſible or inacceſſible; to find the hour of the day, &c.

Its deſcription.

The outward arc is divided into 90 parts or degrees, (being the fourth part of the circle of the ſphere) and figured from 10, 20, *&c.* to 90; above which figures are letters ſignifying the 12 calendar months of the year, as, J. for January, F. for February, *&c.* And again, over theſe letters for the months, are lines to know the hour of the day, and upon the line GD, are ſights of thin braſs to be ſpied through, or for the ſun to ſhine through, from one to the other. Laſtly, in the middle, or point of the quadrant, *viz.* at A, is a line, or thread of ſilk, fixed through a hole, with a plummet of lead at the end of it, and alſo a ſmall bead in the middle.

Some of the many uſes of this inſtrument follow:

Of heights.

Suppoſe you would know the height of a ſteeple, tower, or tree; hold up the quadrant, and view through the ſights the top of the ſteeple, tower, or tree, and then ſtep forwards or backwards, till you find the plummet hang at liberty juſt at 45 degrees, that is, juſt in the middle of the quadrant; then is the height of the ſteeple, tower, or tree, equal to the diſtance of your ſtanding place from the bottom of the ſteeple, adding for the height that you hold the quadrant from the ground.

To find the hour of the day.

Lay the thread juſt upon the day of the month, then hold it till you ſlip the ſmall bead, or pin's head, to reſt on one of the 12 o'clock lines; then let the ſun ſhine from the ſight at G to the other at D the plummet hanging at liberty, the bead will reſt on the hour-line of the day.

To find the latitude of a place nearly.

Hold up the quadrant, and through the ſights thereof (or along the edge) ſpy, in a clear ſtar-light night, the north pole ſtar; The plummet hanging at liberty, the thread will reſt on the degrees of latitude of the place you are in, or where you take your obſervation.

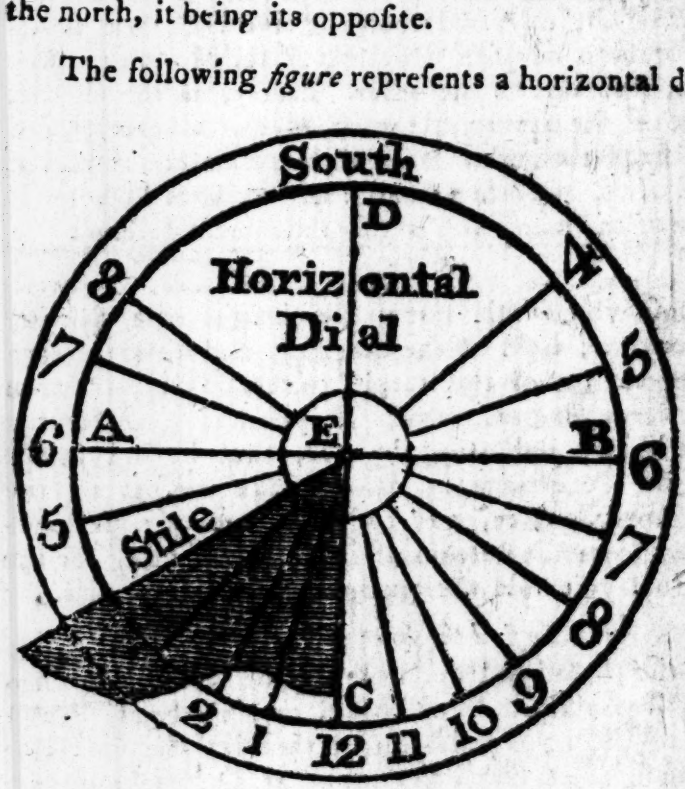
Of

Of DIALLING.

DIALLING is a very ancient art, even as old as the time of king Hezekiah, where in 2 Kings xx. 11. mention is made of the dial of Ahaz.

The gnomon or ſubſtile of a poſt or horizontal dial, ſhould point directly ſouth, and its back will be then directly north. The ſouth may be truly known by a good watch or clock, juſt at noon; for then the ſun is always at the meridian, and makes juſt 12 o'clock; ſo that knowing the ſouth, it will not be difficult to find the north, it being its oppoſite.

The following *figure* repreſents a horizontal dial.



To fix a dial north and ſouth.

Faſten your board on the top of a poſt, and then with your compaſſes make 4, 5, or 6 circles, one within the other, from the centre or middle, where place a large pin perpendicular or upright, and nicely obſerve, when the ſun ſhines in the forenoon, on which circle the head of the pin ſhadoweth; then there make a mark; and do the ſame in the afternoon, when the ſhade of the pin's

pin's head comes on the ſame circle; and from the midway of the two marks, draw a line to the centre, on which place your meridian or 12 o'clock line; ſo will the poſt-dial point north and ſouth.

By the meridian line you may alſo know when the moon, or a ſtar of magnitude, comes to the ſouth; which when they do, they are always at the higheſt, whether by night or day.

Firſt, with a ruler draw the line AB, then croſs it in the centre with another line, as the line CD, which is the meridian or 12 o'clock line; and the firſt line drawn, *viz.* AB, is the ſix o'clock line: then open your compaſſes, and place one foot at the beginning of the degrees, or the arc-edge of your quadrant, and extend the other foot to 60 degrees, and with that extent place one foot in the centre of the dial, at E, where the two firſt lines croſs one another, and draw the ſemicircle ACB.

52°		Lat.	
D.	M.	Hours.	
11	55	1	11
24	26	2	10
38	13	3	9
53	44	4	8
71	9	5	7

Next having the 12 o'clock line EC, to know what diſtance muſt be ſet off from it, for 1 o'clock and 11 o'clock being all one, be directed by this ſmall table, *viz.*

In the firſt column, againſt 1 hour and 11, you find 11 degrees and 55 minutes; which take off the edge of your quadrant, by ſetting one foot of the compaſſes at the beginning of the diviſions under B, and the other foot to 11 degrees 55 minutes; the compaſſes ſo opened, ſet one foot in the circle at the bottom of the 12 o'clock line, and with the other foot of the compaſſes make a mark in the circle, both towards A and B, and from thoſe two marks draw lines towards the centre, which you may afterwards go over with ink. Then to make the hour lines from 2 and 10 o'clock, look in the table for 2 and 10 hours, where you will find 24 degrees and 26 minutes, which take off the degrees of your quadrant, and mark as the other from the 12 o'clock line both ways in the circle.

Note, The ſame is to be done for 3 and 9 o'clock; and alſo for 4 and 8 o'clock; and the like for 5 and 7 o'clock; and for 5 and 7, 4 and 8, above the 6 o'clock line, ſet off the ſame diſtances as below it,

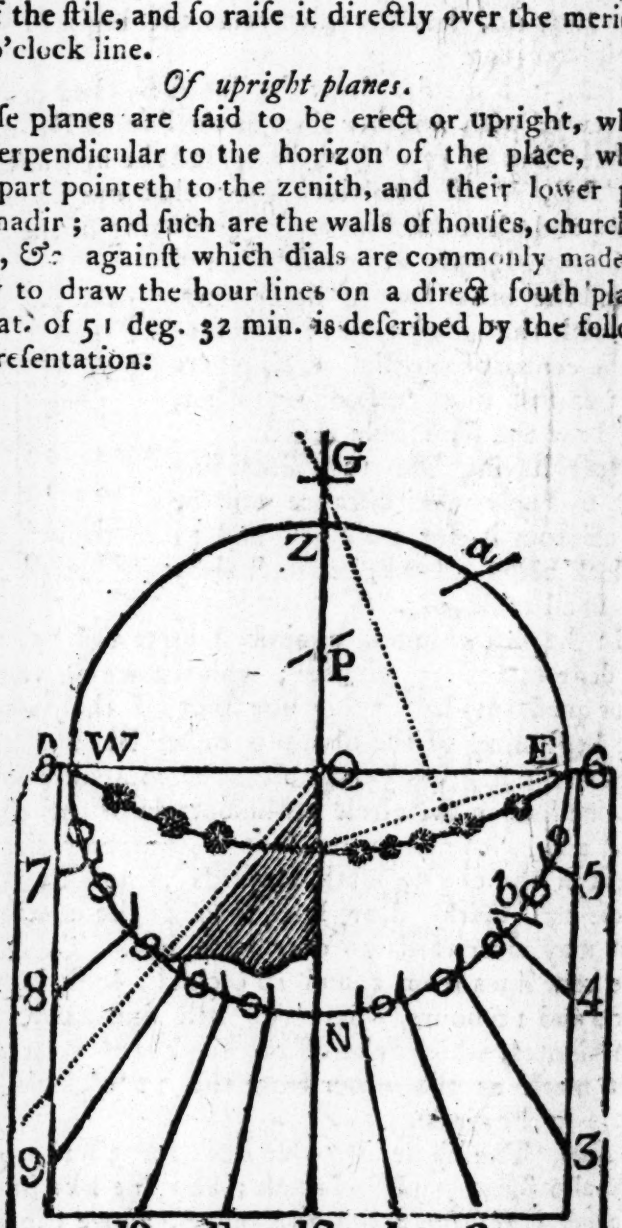
Then

Then for the height of the gnomon or ſtile, admit 5[illegible] degrees, take it off the edge of the quadrant with th[illegible] compaſſes as before, and with that extent ſet one foot a[illegible] the bottom of the 12 o'clock line, as before, and extend the other foot in the circle, and make a mark, and then draw a line from thence to E in the centre, for the upper edge of the ſtile, and ſo raiſe it directly over the meridian or 12 o'clock line.

Of upright planes.

Thoſe planes are ſaid to be erect or upright, which ſtand perpendicular to the horizon of the place, whoſe upper part pointeth to the zenith, and their lower part to the nadir; and ſuch are the walls of houſes, churches, ſteeples, &c. againſt which dials are commonly made.

How to draw the hour lines on a direct ſouth plane, in the lat. of 51 deg. 32 min. is deſcribed by the following repreſentation:



Firſt, draw the circle ZEWN, repreſenting an upright direct ſouth plane; next croſs it with the diameters ZQN for the meridian or 12 o'clock line; and WQE for the prime verticle circle, or hour line of ſix.

Secondly, Out of your line of chords, take 38 degrees 28 minutes, (the complement of the latitude of the place) and ſet that diſtance on the dial plane from Z to *a*, and from E to *b*, and from N to *e*.

Thirdly, Lay a ruler from W to *a*, and it will cut the meridian ZN in the point P, the pole of the world: and a ruler alſo laid from W to *b* will cut the meridian in Æ, which is the point through which the equinoctial muſt paſs; for the drawing of which you have three points given, *viz.* EÆ W, and the center will always be in the meridian line ZN.

Fourthly, Divide the ſemicircle ENW into 12 equal parts, as the points OOO, *&c.*

Fifthly, Lay a ruler to Q, and each of thoſe points OOO, and the ruler will croſs the equinoctial circle in the points ***, *&c.* dividing that into 12 unequal parts.

Sixthly, Lay a ruler to P (the pole of the world) and every one of the marks ***, *&c.* and the ruler will croſs the circle of the plane in the points | | |, *&c.*

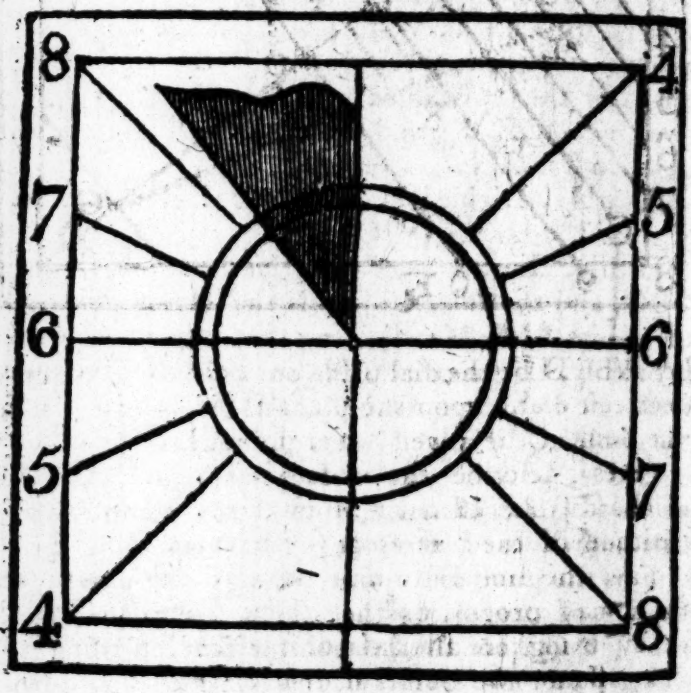
Laſtly, If through the center Q, and the reſpective points | | |, *&c.* you draw right lines, they will be true hour-lines of an erect ſouth plane.

For the gnomon or ſtile, take 38 deg. 28 min. out of the line of chords, and ſet them from N to *e*, drawing the line Q *e* for the axis of the ſtile, which muſt hang directly over the meridian or hour line of 12, and point downwards to the ſouth pole, becauſe the plane beholds the ſouth part of the meridian.

In making this dial, you make two dials: for the erect direct north dial is but the backſide of the ſouth; for as this beholdeth the ſouth part of the meridian; ſo the other faceth the north part of the meridian; and as the meridian line in the ſouth dial ſhews when it is 12 o'clock at noon, ſo the backſide thereof, *viz.* the north ſide, repreſents the hour line of 12 o'clock at midnight, and therefore not expreſſed, nor the hour lines of 9, 10, 11, at night, or of 1, 2, 3, in the morning, the ſun being never ſeen by us above the horizon at thoſe hours; ſo that the north dial is capable of only receiving the hours

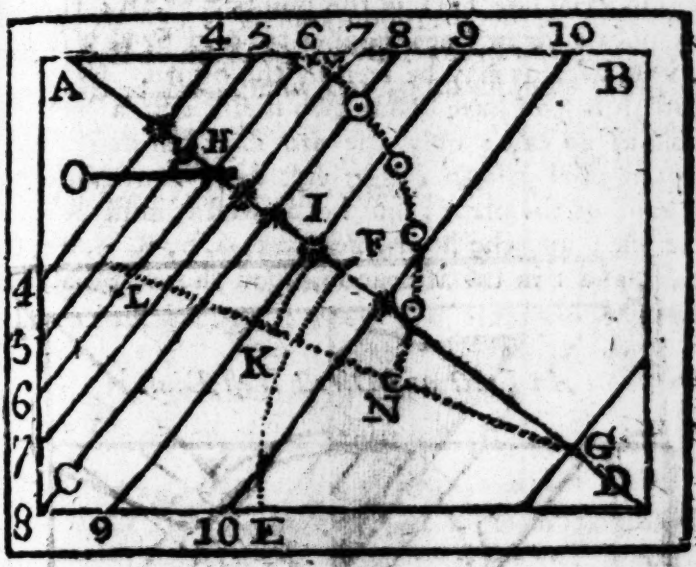
of 4, 5, 6, 7, and 8 in the morning, and 4, 5, 6, 7, a 8 at night, and (in this latitude) not all of them neithe for it ſhines not in this plane at eight in the mornin nor at four in the afternoon, but it is beſt to put the down, as in the figure following, to know how much is paſt 8 in the morning, and what it wants of 5 in th afternoon.

An Erect North Dial.



To draw the hour lines on an erect direct caſt or wes plane.—Hour-lines in theſe dials muſt be parallel to one another, and the dial not have any centre, but drawn a follows:

An Eaſt Direct Dial in Lat. 51 deg. 32 min.



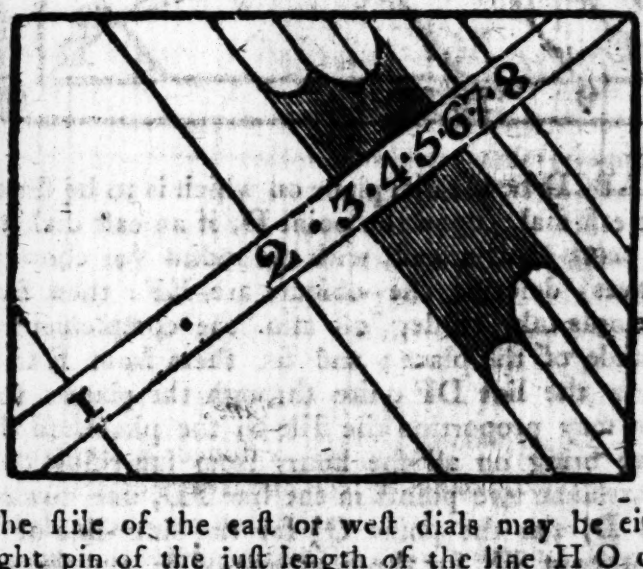
Let ABCD be the dial plane on which is to be drawn a direct eaſt dial: upon the point D, if an eaſt dial, and on the point C, if a weſt, with the radius (or chord of 60 degrees) deſcribe the obſcure arc EF; then from your chords take 38 deg. 28 min. the complement of the latitude of the place; and ſet them from E to F, and draw the line DF quite through the plane; then that you may proportion the ſtile to the plane, ſo that you may bring on all the hours from ſun-riſing to 11 o'clock, aſſume two points in the line FD, one towards the end D, (as the point G) for the hour-line of 11 and another at H, for the hour-line of 6; and through the points G and H, draw the lines 11 G 11 and 6 H 6 on the point G, with the chord of 60 degrees, deſcribe the obſcure arc IK; and taking 15 degrees from the ſcale of chords, in the compaſſes, ſet one foot in I, and with the other cut the arc IK in K; through G and K, draw the line GKL, cutting the line 6 H 6 in the point L; ſo ſhall LH be the height of the perpendicular ſtile proportioned to this plane.

For the drawing of the hour lines, ſet one foot of the compaſſes, (opened to 60 degrees of chords) in L, and with the other deſcribe the arc MN, between the hour-line of 6, and the line GL; which divide into five

equal parts in the points ΘΘΘΘΘ, and a ruler laid from the point L, to each of theſe points ΘΘΘ, *&c.* will cut the equinoctial line HD in the points ***** ; through which points draw lines parallel to 6 H 6, as the lines 7*7, 8*8, *&c.* as may be ſeen in the figure.

And thus you have made two dials, *viz.* a weſt dial as well as an eaſt; only the arc E F, through which the equinoctial paſſeth in the eaſt dial, is drawn on the right hand of the plane; but in the weſt it muſt be drawn on the left; and the hour-lines 4, 5, 6, 7, 8, 9, 10, and 11, 3, 2, and 1 in the afternoon, upon the weſt dial, as in the figure.

An Erect and Direct Weſt Dial.



The ſtile of the eaſt or weſt dials may be either a ſtraight pin of the juſt length of the line H O on the other figure, which is equal to H L fixt on the point H on the hour-line of 6, and exactly perpendicular to the plane, ſhewing the hours by the ſhadow of the apex, or very near the top thereof; or, it may be a plate of braſs of the ſame breadth with the diſtance of the hour-lines of 6 and 3; which plate muſt be ſet perpendicular upon the hour-line of 6, and ſo it will ſhew the hour by the ſhadow on the upper edge thereof, as in the laſt figure.

Of beautifying and colouring Dials.

Firſt, the boards are to be bruſhed over with linſeed oil, thinly ground with Spaniſh brown, done over three

four times (drying between each time), a little thicker each time with the colour; and this is called Priming.

To make the Fat Oil for Colours.

Boil red lead, and linſeed oil, and a little litharge of gold, (about a pennyworth) together, till almoſt as thick as ſyrup; and when cold and well-ſettled, pour the cleareſt into a bottle or bladder for uſe.

The Gold Size for Dials.

Mix fine ground yellow oaker with the aforeſaid fat oil to ſuch a conſiſtency, as when uſed, it may ſettle ſmooth of itſelf.

A mixture for Hour-lines.

Grind vermilion or lamp black with the fat oil.

To draw golden letters or figures for the hours.

Firſt draw them with a pencil dipt in the gold ſize before mentioned; and when ſo dry as juſt to ſtick to your fingers, then with a ſmooth-edged pen-knife ſhape your leaf gold to your mind; take it up with a piece of cotton-cloth fixed to the end of a ſtick, and lay it on the ſize, preſſing it down with the ſame cotton, and, when dry, bruſh off the looſe gold with a feather, and ſmooth the rough edges of the letters with a pencil dipped in red or black colour.

Of the Dial Plane.

Let the board be of the beſt ſeaſoned, firmeſt, cleareſt oak, one, two, or more feet ſquare, and about three inches thick. Take two boards, and get them planed on both ſides, and then laid in the ſun-ſhine, or near a moderate fire 2 or 3 days together; then plane them again, and fix them with good joints, and faſten them in glueing with wooden pegs, as I have ſeen coopers fix their pieces of heading for their caſks; and when thus glued and dierd plane them again, and then faſten them by nailing two ſmall plates of iron or tin on the back. If you cannot get ſeaſoned wood, but green, then boil it about an hour in water, to make it tough, and keep it from warping. In the general, wood is accounted better than ſtone, becauſe it keeps the colouring more ſtaunch or firm.

Before you colour your dial-plate or board, fix your iron ſtile of 38 degrees, (which indifferently ſerves for

all England); and having marked your hour-lines with ink, and faſtened a nail at the end of each hour-line, that the head of each nail may ſhadow or direct you to the center when it is coloured. And, as it may happen that golden letters or figures may decay in a few years, you may on that account make them with white-lead paint, painted with red in a black margin.——When your dial is finiſhed, and dry, dip a feather in your oil, and anoint it thinly; for the finer you mix or grind the colouring with the oil, the more beautiful it appears, though not ſo laſting.

Theſe hints of colouring dials, put me in mind of ſome other neceſſary touches, relating to ſundry mixtures of colours, and dyeing of ſtuffs, &c. collected from Mr Salmon's *Polygraphice.*

Of Colours and Dyeing.

WHITES are ceruſe, flake-white, and white lead,

Blacks, are lamp-black, burnt cherry-ſtones, and old ivory burnt.

Reds, are red lead, vermilion, red ochre, and Indian lake.

Greens, are verdigreaſe, verditure, and ſap-green made of the juice of buckthorn berries.

Yellows, are ſaffron, yellow pink, and gambogia.

Brown, is umber burnt.

Gold colour, is orpiment.

Again, Verdigreaſe, with a little ſap-green, makes a good and bright green.

Blues, are ultramarine, ſmalt, indico, and blue bice.

Of mixing Colours.

Colours are mixed by being ground on a ſtone with fair water ſeverally, and dried and kept in paper bags for uſe, except lamp-black, ſaffron, ſmalt, gambogia, and ſap-green.

Blue, to compound; temper a little indico and ſmalt with oil.

A *light Blue*; mix ſmalt and white lead together.

Lead colour; mix lamp-black and white lead together on a marble.

A *Fox colour* is umber burnt.

Gold

Gold colour, is orpiment mixed with fat oil, by a knife on an earthen plate, or galley-tile rather.

To hinder colours from cracking, put oil of walnuts to them.

Yellow colour; beat saffron to powder, and steep it in vinegar. Or, take the yellow chives in white lillies and gum-water mixed for writing.

Red; vermilion with gum water mixed for writing.

Golden letters, to write; mix vermilion and gum armoniac with yolks of eggs.

Of dyeing wool, stuffs, &c.

To dye *blue*, take woad 1 pound, and mix it with four pints of boiling water, and steep whites in it 24 hours.

To dye *red* of a clear colour, take 60 points of water wherein bran has been steeped 24 hours; and when strained, dissolve two pounds of allum, and 1 pound of tartar; in which water boil what you have to dye for two hours; then take it out, and boil it in half as much fresh water, made of bran, *viz.* 30 pints, to which add madder 3 pounds, and so perfect the colour with moderate warmth, without boiling.

To dye *green*, first make a yellow by the direction underneath; then take 60 pints of water wherein bran hath been soaked, aforesaid; then strain it, let 3 pounds of allum be dissolved in it, and then boil what you have to dye in it for two hours.

To dye *yellow*, take woad 2 pounds, of the said water of bran, and boil till the colour is good.

And if you would have the said *yellow* to be *green*, put the stuff into the aforesaid *blue lye*.

To dye a *sad colour*, add logwood to the *black lye* before-mentioned.

To dye linen or thread, *&c. light red*; take powder of Brazil and vermilion, of each one ounce boiled in allum-water, *&c.*

To dye linen or thread *yellow*; dissolve gambogia in allum-water, *&c.*

To stain skins *blue*; boil elder-berries, and with the liquor brush over the skins, and wring them; then boil the berries in allum-water, and wet them twice over.

Of Money.

THE current coin of this nation, is made either of copper, ſilver or gold. Of *copper* are made the farthings and halfpence. Of *ſilver*, the pennies, two-pences, three-pences, groats, ſixpences, ſhillings, half-crowns, and crowns: but there is very little ſilver coined below the ſixpences. Of *gold* is made the quarter-guinea, the half-guinea, the guinea, and the 5 guinea-piece: beſides, there are foreign pieces of gold, that paſs, though with ſome ſcruple; as the Portugueſe *moidore*, at 27 *s.* pieces of 36*s.* each; and others of 3*l.* 12*s.* There are alſo ſome few ancient pieces of gold of a pale colour, as being alloyed with ſilver, and therefore may be reckoned the beſt, and ſometimes called angel or crown gold; whereas the old gold or broad pieces are moſtly alloyed with copper, which makes them of a reddiſh colour.

Imaginary Money.

We appropriate ſeveral names to money of which there is no coin; as,

	s.	*d.*
The pound of — — — —	20	0
The mark — — — — —	13	4
The noble, or half-mark — — —	6	8
The angel — — — —	10	0

In England, accounts are kept in pounds, ſhillings, and pence ſterling; and their marks are derived from their names in Latin, *viz. l. libræ* or pounds, *s.* for *ſolidi* or ſhillings, *d.* for *denarii* or pence, *qr.* for *quadrantes* or farthings, 4 make a penny; and are expreſſed or ſet down thus: 4*l.* 16*s.* 8*d* 2 *qr.* but better thus, *l.* 4——16——8½; the mark for pounds ſtanding before the ſum denominates the firſt number, and the others are known of courſe; for after pounds follow ſhillings, and after ſhillings ſucceed pence, *&c.* When the price of any thing is ſhillings, and pence, and parts of a penny, it is ſet down thus: 4*s.* 6½*d.* or thus, 4 : 6½. The latter way by ſome is accounted the neateſt, and beſt method to expreſs parts of a penny, or farthings; thus,

¼ a farthing, or one fourth part of what it follows.
½ a halfpenny, or one half of what it follows.
¾ three farthings, or 3-4ths of what it follows.

And

And being thus set fraction-wise, the under figure shews how many parts the quantity before it is divided into, and the upper figure shews how many of those under parts the fraction stands for: as thus, $\frac{3}{4}$ of an ell, $\frac{3}{4}$ of a foot, or 9 inches; and the same of a shilling is 9 pence; of a pound is 15*s*.

Yds.

If you are to set down 6 yards and half write thus, $6\frac{1}{2}$

Nineteen hundred three quarters, thus, $19\frac{3}{4}$ C

Sixteen pounds and a quarter, thus, $16\frac{1}{4}$ lb.

or else thus, 19 C $\frac{3}{4}$, 16 lb $\frac{1}{4}$, 5 feet $\frac{1}{2}$, 14 days $\frac{1}{4}$.

Here the name is put between the whole number and the fraction, which I think is the plainer and better way; for example, $6\frac{1}{2}$ hhds. through ignorance, or wilfulness, may be read six half hhds. as well as six hhds. and a half; and at a certain place where I have had business, the wharfingers clerks expressed their half hhds. in this manner.

Table of the value of Gold and Silver.

		l.	*s.*	*d.*
Gold	1 Pound is worth	48	0	0
	1 Ounce	4	0	0
	1 Penny-weight	0	4	0
	1 Grain	0	0	2
Silver	1 Pound is worth	3	0	0
	1 Ounce	0	5	0
	1 Penny-weight	0	0	3
	1 Grain	0	0	$\frac{1}{2}$

A Table,

A TABLE, exhibiting at one view the value of any number of Portugal pieces of gold, in Engliſh pounds and ſhillings.

Portugal pieces.												
Num. pieces	at 3 12 0			at 1 16 0			at 0 18 0			at 1 7 0		
	l.	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*
1	3	12	0	1	16	0	0	18	0	1	7	0
2	7	4	0	3	12	0	1	16	0	2	14	0
3	10	16	0	5	8	0	2	14	0	4	1	0
4	14	8	0	7	4	0	3	12	0	5	8	0
5	18	0	0	9	0	0	4	10	0	6	15	0
6	21	12	0	10	16	0	5	8	0	8	2	0
7	25	4	0	12	12	0	6	6	0	9	9	0
8	28	16	0	14	8	0	7	4	0	10	16	0
9	32	8	0	16	4	0	8	2	0	12	3	0
10	36	0	0	18	0	0	9	0	0	13	10	0
20	72	0	0	36	0	0	18	0	0	27	0	0
30	108	0	0	54	0	0	27	0	0	40	10	0
40	144	0	0	72	0	0	36	0	0	54	0	0
50	180	0	0	90	0	0	45	0	0	67	10	0
60	216	0	0	108	0	0	54	0	0	81	0	0
70	252	0	0	126	0	0	63	0	0	94	10	0
80	288	0	0	144	0	0	72	0	0	108	0	0
90	324	0	0	162	0	0	81	0	0	121	10	0
100	360	0	0	180	0	0	90	0	0	135	0	0
200	720	0	0	360	0	0	180	0	0	270	0	0
300	1080	0	0	540	0	0	270	0	0	405	0	0
400	1440	0	0	720	0	0	360	0	0	540	0	0
500	1800	0	0	900	0	0	450	0	0	675	0	0
600	2160	0	0	1080	0	0	540	0	0	810	0	0
700	2520	0	0	1260	0	0	630	0	0	945	0	0
800	2880	0	0	1440	0	0	720	0	0	1080	0	0
900	3240	0	0	1620	0	0	810	0	0	1215	0	0
1000	3600	0	0	1800	0	0	900	0	0	1350	0	0
5000	18000	0	0	9000	0	0	4500	0	0	6750	0	0
10000	36000	0	0	18000	0	0	9000	0	0	13500	0	0

A TABLE for buying or selling any commodity by the great hundred, which is 112 pounds.

d.	*q.*	*l.*	*s.*	*d.*	*d.*	*q*	*l.*	*s.*	*d.*	*d.*	*q*	*l.*	*s.*	*d*	*d.*	*q.*	*l.*	*s.*	*d.*
0	1	0	2	4		1	2	18			1	5	14			1	8	10	4
	2	0	4	8		2	3	0			2	5	16	8		2	8	12	8
	3	0	7	0		3	3	3			3	5	19	0		3	8	15	0
1	0	0	9	4	7	0	3	5	4	13	0	6	1	4	19	0	8	17	4
	1	0	11	8		1	3	7			1	6	3	8		1	8	19	8
	2	0	14	0		2	3	10	0		2	6	6	0		2	9	2	0
	3	0	16	4		3	3	12	4		3	6	8	4		3	9	4	4
2	0	0	18	8	8	0	3	14	8	14	0	6	10	8	20	0	9	6	8
	1	1	1	0		1	3	17	0		1	6	13	0		1	9	9	0
	2	1	3	4		2	3	19	4		2	6	15	4		2	9	11	4
	3	1	5	8		3	4	1	8		3	6	17	8		3	9	13	8
3	0	1	8	0	9	0	4	4	0	15	0	7	0	0	21	0	9	16	0
	1	1	10	4		1	4	6	4		1	7	2	4		1	9	18	4
	2	1	12	8		2	4	8	8		2	7	4	8		2	10	0	8
	3	1	15	0		3	4	11	0		3	7	7	0		3	10	3	0
4	0	1	17	4	10	0	4	13	4	16	0	7	9	4	22	0	10	5	4
	1	1	19	8		1	4	15	8		1	7	11	8		1	10	7	8
	2	2	2	0		2	4	18	0		2	7	14	0		2	10	10	0
	3	2	4	4		3	5	0	4		3	7	16	4		3	10	12	4
5	0	2	6	8	11	0	5	2	8	17	0	7	18	8	23	0	10	14	8
	1	2	9	0		1	5	5	0		1	8	1	0		1	10	17	0
	2	2	11	4		2	5	7	4		2	8	3	4		2	10	19	4
	3	2	13	8		3	5	9	8		3	8	5	8		3	11	1	8
6	0	2	16	0	12	0	5	12	0	18	0	8	8	0	24	0	11	4	0

EXAMPLE.

First, at 5*d.* 3*q.* the pound, what is the great hundred? Look in the table for 5*d.* 3*q.* in the first column, and against it in the second you shall find 2*l.* 13*s.* 8*d.* and so much will 112 pounds cost. Again if a hundred-weight cost 4*l.* 8*s.* 8*d.* find 4*l.* 8*s.* 8*d.* and against it in the column towards the left hand, you will find 9*d.* 2*q.* and so much it is by the pounds.

Note, For every farthing that one pound doth cost reckon two shillings and four pence, and that is the price of the great hundred.

INTEREST

INTEREST at *three per Cent.*

	for one day.				*Thirty days.*				*A year.*			
Princip.	*l.*	*s.*	*d.*	*f.*	*l.*	*s.*	*d.*	*f.*	*l.*	*s.*	*d.*	*f*
L. 1								2			7	1
2							1	0		1	2	1
3							1	3		1	9	2
4							2	1		2	4	3
5							3	0		3	0	0
6							3	2		3	7	1
7							4	0		4	2	1
8							4	3		4	9	3
9							5	1		5	7	3
10							5	3		6	0	
20				1			11	3		12	0	
30				2		1	5	3		18	0	
40				3		1	11	2	1	4	0	
50			1	0		2	5	2	1	10	0	
60			1	0		2	11	2	1	16	0	
70			1	1		3	5	1	2	2	0	
80			1	2		3	11	1	2	8	0	
90			1	3		4	5	1	2	14	0	
100			2	0		4	11	0	3	0	0	
200			3	3		9	10	1	6	0	0	
300			5	3		14	9	3	9	0	0	
400			7	3		19	8	3	12	0	0	
500			10	0	1	4	7	2	15	0	0	
600			11	3	1	9	7	0	18	0	0	
700		1	1	3	1	14	6	1	21	0	0	
800		1	3	3	1	19	5	1	24	0	0	
900		1	5	3	2	4	4	2	27	0	0	
1000		1	7	3	2	9	3	3	30	0	0	
2000		3	3	2	4	18	7	2	60	0	0	
3000		4	11	0	7	7	11	1	90	0	0	
4000		6	6	3	9	17	3	0	120	0	0	
5000		8	2	2	12	6	7	0	150	0	0	
6000		9	10	1	14	15	10	3	180	0	0	
7000		11	6	0	17	5	2	2	210	0	0	
8000		13	1	3	19	14	6	1	240	0	0	
9000		14	9	2	22	3	10	0	270	0	0	
10000		16	5	1	24	13	1	3	300	0	0	

INTEREST at *four per Cent.*

	for one day				*Thirty days.*				*A year.*			
Princip	*l.*	*s.*	*d.*	*f.*	*l.*	*s.*	*d.*	*f.*	*l.*	*s.*	*d.*	*f.*
L. 1								3			9	2
2							1	2		1	7	1
3							2	1		2	4	3
4							3	1		3	2	2
5							4	0		4	0	0
6							4	3		4	9	2
7							5	2		5	7	1
8							6	1		6	4	3
9							7	0		7	2	2
10				1			7	3		8	0	
20				2		1	3	3		16	0	
30				3		1	11	2	1	4	0	
40			1	0		2	7	2	1	12	0	
50			1	1		3	3	1	2	0	0	
60			1	2		3	11	1	2	8	0	
70			1	3		4	6	3	2	16	0	
80			2	0		5	3	0	3	4	0	
90			2	1		5	11	0	3	12	0	
100			2	2		6	6	3	4	0	0	
200			5	1		13	1	3	8	0	0	
300			7	3		19	8	3	12	0	0	
400			10	2	1	6	3	2	16	0	0	
500		1	1	0	1	12	10		20	0	0	
600		1	3	3	1	19	5	1	24	0	0	
700		1	6	2	2	6	0	1	28	0	0	
800		1	9	0	2	12	7	1	32	0	0	
900		1	11	2	2	19	2	0	36	0	0	
1000		2	2	1	3	5	9		40	0	0	
2000		4	4	2	6	11	6		80	0	0	
3000		6	6	3	9	17	3		120	0	0	
4000		8	9	0	13	3	0		160	0	0	
5000		10	11	2	16	8	9	1	200	0	0	
6000		13	1	3	19	14	6	1	240	0	0	
7000		15	4	0	23	0	3	1	280	0	0	
8000		17	6	1	26	6	0	1	320	0	0	
9000		19	8	3	29	11	9	1	360	0	0	
10,000	1	1	11	0	33	17	6	2	400	0	0	

INTEREST at *five per Cent.*

Princip.	*for one day.* l. s. d. f.	*Thirty days.* l. s. d. f.	*A year.* l. s. d. f.
L. 1		1 0	1
2		2 0	2
3		3 0	3
4		3 3	4
5		4 3	5
6		5 3	6
7		6 3	7
8	1	7 3	8
9	1	8 3	9
10	1	9 3	10
20	3	1 7 3	1 0
30	4 0	2 5 2	1 10
40	1 1	3 3 2	2 0
50	1 2	4 1 1	2 10
60	2 0	4 11 0	3 0
70	2 1	5 9 0	3 10
80	2 2	6 6 3	4 0
90	3 0	7 4 3	4 10
100	3 1	8 2 2	5
200	6 2	16 5 1	10
300	9 3	1 4 7 3	15
400	1 1 0	1 12 10 2	20
500	1 4 1	2 1 1, 0	25
600	1 7 3	2 9 3 3	30
700	1 11 0	2 17 6 1	35
800	2 1 1	3 5 9 0	40
900	2 5 1	3 13 11 2	45
1000	2 8 3	4 2 2 1	50
2000	5 5 3	8 4 4 2	100
3000	8 2 2	12 6 6 3	150
4000	10 11 2	16 8 9 1	200
5000	13 8 1	20 10 11 2	250
6000	16 5 0	24 13 1 3	300
7000	19 2 0	28 15 4 1	350
8000	1 1 11 0	32 17 6 1	400
9000	1 4 7 2	36 19 8 3	450
10,000	1 7 4 3	41 1 11 0	500

A him

A hint of generals, or things proper to be known and remembered on particular occaſions.

A REAM of paper, 20 quires.
A quire of paper, 24 ſheets.
A bale of paper, 10 reams.
A roll of parchment, 5 dozen, or 60 ſkins.
A dicker of hides, 10 ſkins.
Ditto of gloves, 10 dozen pair.
A laſt of hides, 20 dickers.
A load of timber unhewed, 40 feet.
A chaldron of coals, 36 buſhels.
A hogſhead of beer, 63 gallons.
Ditto of wine, 54 gallons.
A barrel of beer, 36 gallons.
Ditto of ale, 32 gallons.
A groſs, 144 or 12 dozen.
A weigh of cheeſe, 256 pounds.
Days in a year 365, weeks 52, and hours, 8766.
Pence in a pound, 240, farthings 960.
An acre of land, 160 ſquare poles, or perches.
A laſt of corn or rape ſeed, 10 quarters.
A quarter in England, 8 buſhels; in Scotland, 4 bolls.
Ditto of pot-aſhes, cod-fiſh, white-herrings, meal, pitch, and tar, 12 barrels.
Ditto of flax and feathers, 17 C. of gun-powder, 24 barrels, or 2400 lb; of wool, 4368 lb.
A tun of wine, 252 gallons; oil of Greenland, 252 gallons; and ſweet oil of Genoa, 236 gallons.
A ton in weight, 20 C. of iron, &c. but of lead there is but 19 C. and a half, called a fodder or fother.
A todd of wool, 28 pounds.
A pack of ditto, 364 pounds.
A load of bricks, 500; and of plain tiles, 1000.
A ſtone of fiſh, 8 lb; and of wool, 14 lb. The ſame for horſeman's weight, and alſo hay; but pepper, cinnamon, and allum, have but 13 ½ lb. to the ſtone.
Ditto of glaſs, five pounds; and a ſeam of ditto, 24 ſtone.
A truſs of hay, 56 pounds; and a load of ditto, 39 truſſes.
Note, *New hay in June and Auguſt, ought to be* 60 *pound to the truſs, as* per *ſtatute of* 2*d of William and Mary*, 1693.

A cade of red herrings, 500; and of ſprats 1000.
Iron and ſhot, 14 lb. to the ſtone.

Barrels of ſundry commodities.

Anchovies, 30 lb.	Raiſins, 1 C.
A double barrel, 60 lb.	Oil, 31 gallons and a half.
Nuts or apples, 3 buſhels.	Spaniſh tobacco, 2 C. to 3 C.
Pot-aſh or barilla, 200 lb.	
White or black plates, 300.	Gun-powder 1 C.
Candles, 10 doz. lb.	Soap, 240 lb.
Salmon or eels, 42 gal.	Butter, 224 lb.
Figs, 3 qrs. 14 lb. to 2 C¼.	Herrings, 32 gallons.

Things in wholeſale trade bought and ſold by the thouſand.

Cuttle bones.	Bricks.
Oranges and lemons.	Clinkers or Flanders tiles.
Chair-nails.	Billets and leaves of horn.
Tacks and tenter hooks.	Barrel hoops.
Pomegranates and tazels.	Squirrel-ſkins.
Gooſe-quills and thimbles.	Slate and hilling ſtones.

Pins and ſmall needles by the 1000 dozens.

Things bought and ſold at ſixſcore to the hundred.

Banks and barlings.	cole, ling, and Newfound-
Barrel and pipe boards.	land fiſh, ſtock-fiſh of all
Bomſpars and bow-ſtaves.	ſorts.
Canſpars and caprevans.	Ells of canvaſs, and moſt
Herrings and deal boards.	foreign linens.
Nails, eggs, and cod-fiſh,	Hogſhead ſtaves.

Of Bonds, Bills, Indentures, Letters of Attorney, Wills, and other uſeful Writings.

Precedents of theſe are very neceſſary, not only for the underſtanding of them, but to know how to make them properly on occaſion.

A bond from one to one.

KNOW all men by theſe preſents, that I Abraham Darnel, of the pariſh of St Sepulchre, in the city of London, Gentleman, am held and firmly bound to John Melver of the ſaid city of London, Eſq; in the ſum of fifty pounds of good and lawful money of Great Britain, to be paid to the ſaid John Melver, or to his certain attorney, his executors, adminiſtrators, or aſſigns; for the true payment whereof, I bind myſelf, my heirs, executors, and adminiſtrators, firmly by theſe preſents

preſents ſealed with my ſeal. Dated this twenty-firſt day of January, in the twenty-ſixth year of the reign of our ſovereign Lord George the Third, by the Grace of God, of Great Britain, France, and Ireland, King, defender of the faith, and ſo forth, and in the year of our Lord One thouſand ſeven hundred and eighty-ſix.

The condition of this obligation is ſuch, that if the above-bounden Abraham Darnel, his heirs, executors, or adminiſtrators, do well and truly pay, or cauſe to be paid, to the above-named John Melver, his executors, adminiſtrators, or aſſigns, the full ſum of twenty-five pounds of good and lawful money of Great Britain, on the twentieth day of Auguſt next enſuing the date hereof, with the lawful intereſt thereof; then this obligation to be void, or elſe to remain, continue, and be in full force and virtue.

Sealed and delivered (being first duly ſtamped) in the preſence of *Abraham Darnell.* +

Gregory Needy.
Thomas Truſty.

Note, *The mark* + *in this and the forms ſubſequent repreſents the ſeal, which in this, and all thoſe in which it appears, ought to be affixed; the perſon who executes any of them (a will excepted, concerning which directions will be given in its place) is, in the preſence of the witneſſes, to take of the ſeal, that is, the inſtrument with which the impreſſion was made, and then taking the paper or parchment in his or her right hand, is to pronounce theſe words, 'I deliver this my act and deed for the purpoſes within-'mentioned.'*

A bill with a penalty.

KNOW all men by theſe preſents, That I John Jenkins, of the city of Chicheſter, in the county of Suſſex, victualler, do acknowledge myſelf indebted to Martin Moneyman of Eaſt Grinſtead, in the county aforeſaid, graſier, in the ſum of twenty pounds of good and lawful money of Great Britain, to be paid unto the ſaid Martin Moneyman, his heirs, executors, adminiſtrators, or aſſigns, in or upon the 29th day of September next enſuing the date hereof, without fraud or further delay; for and in conſideration of which payment well and truly to be made and done, I bind myſelf, my heirs, executors, and adminiſtrators, in the penal ſum of forty

pounds, of the like lawful money, firmly by theſe preſents. In witneſs whereof I have hereto ſet my hand and ſeal this twenty-fifth day of March, in the twenty-ſixth year of the reign of our ſovereign King George the Third and in the year of our Lord God 1786.

Signed, ſealed, and delivered in the preſence of *John Jenkins.*
Titus Teſtimony.
Andrew Affidavit.

A ſhort bill or note of one's hand.

KNOW all men by theſe preſents, that I Peter Pennyleſs of the pariſh of St Saviour's, Southwark, in the county of Surry, blackſmith, do owe, and own myſelf to ſtand indebted to Robert Rich, of the pariſh of St Andrew, Holborn, in the county of Middleſex, Gent. in the juſt and due ſum of five pounds of lawful money of Great Britain, which by theſe preſents I promiſe to pay unto him the ſaid Robert Rich, at or upon the ſixth day of October next enſuing the date hereof; for the true performance of which payment, well and truly to be made, and in witneſs hereof, I have ſet my hand to theſe preſents this fifth day of May, 1786,

Peter Pennyleſs.

Among men of buſineſs, the following form is commonly uſed and is equally effectual in law:

I Promiſe to pay to Mr Robert Rich, or his order, the ſum of five pounds, five months after date, for value received, this fifth day of May, 1788, by

Peter Pennyleſs.

This note is tranferable to another, if Robert Rich writes his name on the back thereof; but then if Peter Pennyleſs doth not pay it, Robert Rich is liable thereto.

A penal bill from two to one.

KNOW all men by theſe preſents, That we Laurence Luckleſs and Peter Pauper, both of the pariſh of Saint Dunſtan, Stepney, in the country of Middleſex, weavers, do aknowledge and own ourſelves to ſtand indebted to Gabriel Greedy, of the pariſh of St. Olave, Southwark, in the county of Surry, felt-maker, in the juſt and due ſum of ten pounds, of good and lawful money of Great Britain, to be paid unto him the ſaid Gabriel Greedy, his heirs, executors, adminiſtrators, or aſſigns,

aſſigns, at or upon the thirteenth day of October next enſuing the date hereof, without fraud or further delay; for and in conſideration of which payment well and truly to be made, we do bind our heirs, executors, and adminiſtrators, in the penal ſum of twenty pounds of the like lawful money, firmly by theſe preſents. In witneſs whereof, we have hereunto ſet our hands and ſeals, this ſixteenth day of February, in the twenty eighth year of the reign of our ſovereign Lord King George the Third, *&c.* and in the year of our Lord One thouſand ſeven hundred and eighty-eight.

Signed, ſealed, and delivered in the preſence of Wimbleton Witneſs. Timothy Teſtis.

Lau. Luckleſs. ⊣
Peter Pauper. ⊣

Note, *That bills without penalty are of no more force or laſting than book-debts, as they are not ſealed; yet they are eſteemed better ſecurity, becauſe the party's hand, if he contends, may be proved againſt him: but oft times, on an adjuſtment of accounts, it is uſed to have the party's hand to the book, which is as valid as the other; but, in my opinion, there ought to be a witneſs to either of them.*

Note alſo, *All obligations ought to be in Engliſh, and the words at length; they may be ſuited to any condition, by only altering the name or names, place or places of abode, title or titles, ſum or ſums of money, date,* &c.

Every bond, letter of attorney, indenture, and other thing to which a ſeal is affixed, wills excepted, muſt, to render it effectual, be ſtamped with a four ſhillings ſtamp.

Thus you may proceed of yourſelf, and ſave the charge of going too far diſtant to a ſcriviner, or an attorney, here being no other charge neceſſary but the ſtamped paper and your own trouble of writing.

A letter of attorney.

KNOW all men by theſe preſents, That I Charles Careful of Lewes, in the county of Suſſex, apothecary, (for divers conſiderations and good cauſes me hereunto moving,) having made, ordained, conſtituted, and appointed, and by theſe preſents do, make, ordain, conſtitute, and appoint, my truſty friend William Wagſtaff, of Pempſey, in the county aforeſaid, Gentleman, my true and lawful attorney, for me, in my name, and to my uſe,

uſe, to aſk, demand, recover, or receive, of and from A. B. of Rye, in the ſaid county, the ſum of forty pounds; giving, and by theſe preſents granting, to my ſaid attorney, my ſole and full power and authority, to take, purſue, and follow ſuch legal courſes, for the recovery, receiving, and obtaining of the ſame, as I myſelf might or could do, were I perſonally preſent; and, upon the receipt of the ſame, acquittances, and other ſufficient diſcharges, for me, and in my name, to make, ſign, ſeal, and deliver; as alſo, one or more attorney or attorneys under him to ſubſtitute or appoint, and again, at his pleaſure, to revoke; and further to do, perform, or execute, for me, and in my name, all and ſingular thing or things which ſhall or may be neceſſary, touching and concerning the premiſſes, as fully, thoroughly, and entirely, as I the ſaid Charles Careful, in my own perſon, ought or could do in and about the ſame; ratifying, allowing, and confirming, whatſoever my ſaid attorney ſhall lawfully do, or cauſe to be done, in and about the execution of the premiſſes, by virtue of theſe preſents. In witneſs whereof, I have hereunto ſet my hand and ſeal, the ſixth day of May, in the twenty-ſixth year of the reign of our ſovereign Lord George the Third, by the grace of God King of Great Britain, &c. and in the year of our Lord One thouſand ſeven hundred and eighty-ſix.

A letter of attorney, by a ſeaman.

KNOW all men by theſe preſents, That I Timothy Tarpaulin, mariner, now belonging to his Majeſty's ſhip the Rye, for divers good cauſes and conſiderations me thereunto moving, have, and by theſe preſents do make my truſty friend Henry Hearty, citizen and baker of London, (or my beloved wife Penelope Tarpaulin,) my true and lawful attorney, for me, and in my name, and for my uſe, to aſk, demand, and receive, of and from the Right Honourable the Treaſurer and Paymaſter of his Majeſty's navy, and the Comiſſioners of prize-money, and whom elſe it may concern, as well all ſuch wages and pay, bounty money, prize money, and all other ſum or ſums of money whatſoever, as now are, and which hereafter ſhall or may be due, or payable unto me; alſo all ſuch penſions, ſalaries, ſmart-money, or all other money and things whatſoever, which now are, or at any time hereafter ſhall or may be due to me for my ſervice,

or

or otherwiſe in any one of his Majeſty's ſhip or ſhips, frigates or veſſels; giving and hereby granting unto the ſaid attorney, full and whole power, to take, purſue, and follow ſuch legal ways and courſes, for the recovery, receiving, and obtaining, and diſcharging upon the ſaid ſum or ſums of money, or any of them, as I myſelf might or could do, were I perſonally preſent: and I do hereby ratify, allow, and confirm, all and whatever my attorney ſhall lawfully do, or cauſe to be done, in and about the execution of the premiſſes, by virtue of theſe preſents. In witneſs whereof, I have hereunto ſet my hand and ſeal this twenty-ſecond day of March, One thouſand ſeven hundred and eighty-eight.

Timothy Tarpaulin. L. S.

A ſhort will in legal form.

IN the name of God, *Amen.* I William Weakly, of the city of London, haberdaſher, being very ſick and weak in (or, in perfect health of) body, but (or, and) of perfect mind and memory, thanks be given unto God; calling unto mind the mortality of my body, and knowing that it is appointed for all men once to die, do make and ordain this my laſt will and teſtament; that is to ſay, principally and firſt of all, I give and recommend my ſoul into the hand of Almighty God that gave it, and and my body I recommend to the earth, to be buried in decent Chriſtian burial, at the diſcretion of my executors: nothing doubting but at the general reſurrection I ſhall receive the ſame again, by the mighty power of God. And as touching ſuch worldly eſtate wherewith it has pleaſed God to bleſs me in this life, I give, demiſe, and diſpoſe of the ſame in the following manner and form:

Firſt, I give and bequeath to Eliſabeth, my dearly-beloved wife the ſum of five hundred pounds of lawful money of England, to be raiſed and levied out of my eſtate, together with all my houſehold goods, debts, and moveable effects.

Alſo, I give to my well-beloved daughter Eliſabeth Weakly, whom I likewiſe conſtitute, make, and ordain the ſole executrix of this my laſt will and teſtament, all and ſingular my lands, meſſuages and tenements by her freely to be poſſeſſed and enjoyed. And I do hereby utterly diſallow, revoke, and diſannul all and every other former teſtaments, wills, legacies, bequeſts, and executors,

tors, by me in any wiſe before-named, willed, and bequeathed; ratifying and confirming this, and no other, to be my laſt will and teſtament. In witneſs whereof, I have hereunto ſet my hand and ſeal this twelfth day of April, in the year of our Lord One thouſand ſeven hundred and eighty-eight.

Signed, ſealed, publiſhed, pronounced, and declared by the ſaid William Weakly, as his laſt will and teſtament, in the preſence of us, who, in his preſence and in the preſence of each other, have hereto ſubſcribed our names:

Henry Hardy.
Samuel Short.
William Wortle.

Will. Weakly. +

The teſtator, after taking off the ſeal, muſt in the preſence of the witneſſes, pronounce theſe words. *I publiſh and declare this to be my laſt will and teſtament.*

Note, *If a will be already made, and the perſon hath no mind to alter it, but to add ſomething more, there may b affixed the following codicil or ſchedule to it, and it will ſtand good in law, as part of the will.*

A codicil to a will.

Be it known to all men by theſe preſents, That I William Weakly, of the city of London, haberdaſher, have made and declared my laſt will and teſtament in writing, bearing date the twelfth day of April One thouſand ſeven hundred and eighty-eight. I the ſaid William Weakly, by this preſent *codicil*, do ratify and confirm my ſaid laſt will and teſtament, and do further give and bequeath unto my loving couſin and god-ſon William Weakly, junior, the ſum of fifty pounds of good and lawful money of England, to be paid unto him the ſaid William Weakly, by my executrix, out of my eſtate: and my will and meaning is, that this *codicil* be adjudged to be a part and parcel of my laſt will and teſtament: and that all things therein mentioned and contained, be faithfully and truly performed, and as fully and amply in every reſpect, as if the ſame were ſo declared and ſet down in my ſaid laſt will and teſtament.

Witneſs

Witneſs my hand this twentieth day of April, One thouſand ſeven hundred and eighty-eight. *William Weakly.*

Signed, in the preſence of us,
A. B.
C. D.

A deed of gift.

TO all men to whom theſe preſents ſhall come, I George Generous do ſend greeting: Know ye, That I the ſaid George Generous, of the pariſh of Pancras, in the county of Middleſex, brick-maker, for and in conſideration of the love, good-will, and affection which I have and do bear towards my loving ſiſter Sarah Sorrowful, of the ſame pariſh and county, widow; have given and granted, and by theſe preſents do freely give and grant unto the ſaid Sarah Sorrowful, her heirs, executors, or adminiſtrators, all and ſingular my goods and chattels, now being in my preſent dwelling-houſe in the pariſh aforeſaid, known by the name of Fiſher's Figgary; of which (before the ſigning of theſe preſents) I have delivered her, the ſaid Sarah Sorrowful, an inventory ſigned with my own hand, and bearing even date, to have and to hold all the ſaid goods and chattels in the ſaid premiſſes or dwelling-houſe, to her the ſaid Sarah Sorrowful, her heirs, executors, or adminiſtrators from henceforth, as her and their proper goods and chattels abſolutely, without any manner of conſideration. In witneſs whereof, I have hereunto put my hand and ſeal, this tenth day of April, One thouſand ſeven hundred and eighty-eight.

Signed, ſealed, and delivered in the preſence of
Daniel Drayton.
Aaron Atkins.

George Generous. ⊹

Note, *This precedent may be extended to the giving away of cattle, corn, houſe, or land, if not entailed,* &c. *but the particulars muſt be named,* &c.

An indenture of apprenticeſhip.

THIS indenture witneſſeth, That Richard Reynolds, ſon of Robert Reynolds, late of Pempſey, in the county of Suſſex, hath put himſelf, and by theſe preſents doth voluntarily put himſelf, apprentice to Charles Carpenter, citizen and linen-draper of London, to learn his art,

art, trade, or myſtery, and after the manner of an apprentice, to ſerve him from the day of the date hereof, for and during the full term of ſeven years next enſuing; during all which time, he the ſaid apprentice his ſaid maſter ſhall faithfully ſerve, his ſecrets keep, his lawful commands every where gladly obey. He ſhall do no damage to his ſaid maſter, nor ſee it to be done by others without letting or giving notice thereof to his ſaid maſter. He ſhall not waſte his ſaid maſter's goods, or lend them unlawfully to others. He ſhall not commit fornication, nor contract matrimony within the ſaid term. At cards, dice, or any unlawful game, he ſhall not play, whereby his ſaid maſter may be damaged. With his own goods, or the goods of others, during the ſaid term, without licence of his ſaid maſter, he ſhall neither buy nor ſell. He ſhall not abſent himſelf day or night from his ſaid maſter's ſervice, without his leave; nor haunt alehouſes, taverns, or play-houſes; but in all things behave himſelf as a faithful apprentice ought to do, during the ſaid term. And the ſaid maſter ſhall uſe the utmoſt of his endeavours to teach or cauſe to be taught and inſtructed, the ſaid apprentice in the trade and myſtery he now profeſſeth, occupieth, or followeth; and procure and provide for him the ſaid apprentice; ſufficient meat, drink, apparel, waſhing, and lodging, fitting for an apprentice, during the ſaid term. And for the true performance of all and every the ſaid covenants and agreements, either of the ſaid parties bind themſelves unto the other by theſe preſents. In witneſs thereof, they have interchangeably put their hands and ſeals this 16th day of April, in the 26th year of the reign of our Sovereign Lord George III. by the grace of God, King of Great Britain, &c. and in the year of Lord God One thouſand ſeven hundred and eighty-ſix.

Note, *If an apprentice be enrolled before a juſtice of the peace, or other proper officer; (the chamberlain being ſuch in London) he cannot ſue out his indenture, but upon proof of unmerciful uſage; want of victuals, and other neceſſaries, or his maſter's being incapable of teaching him his trade, or not cauſing it ſo to be done at his proper charge by others. And the ſame holds good in relation to a miſtreſs. But there being no enrollment, an indenture may be ſued out without ſhewing cauſe in cities and corporations, &c.*

A ge-

A general releaſe.

KNOW all men by theſe preſents, That I Peter Peaceable, of Haſtings, in the county of Suſſex, tobacconiſt, have remiſſed, releaſed, and for ever quit claim to William Winter of Rye, in the county aforeſaid, fiſh-chapman, his heirs, executors, and adminiſtrators, of all, and all manner of action and actions, ſuits, bills, bonds, writings, debts, dues, duties, accounts, ſum and ſums of money, leaſes, mortgages, judgments by confeſſion, or otherwiſe obtained, executions, extents, quarrels, controverſies, treſpaſſes, damages, and demands whatſoever, which by law or equity, or otherwiſe ſoever I the ſaid Peter Peaceable, againſt the ſaid William Winter, ever had, and which I, my heirs, executors, or adminiſtrators, ſhall or may claim, challenge, or demand, for or by reaſon, means, or colour of any matter, cauſe, or thing whatſoever, to the day of the date of theſe preſents. In witneſs whereof, I have hereunto ſet my hand and ſeal, this fifteenth day of April, *&c.*

Peter Peaceable. L. S.

The complete GARDENER; *or, The Practice of Gardening in all its Branches, for the Twelve Months of the Year.*

JANUARY.

Pleaſure-garden.

FROST is to be expected now, and nothing is ſo dangerous to tender flower-roots, and their ſhoots for ſpring. Ranunculuſes, anemonies, and tulips, will be in danger: cover the beds to guard them, lay on peaſe-ſtraw where they are not come up; but where the ſhoot appears, place hoops with mats and cloths upon them. This is the common practice; but in that excellent work, *The complete body of gardening*, lately publiſhed, there is a new method propoſed, and much eaſier and better: this is to place behind them a reed-hedge, ſloping three feet forward. A mat is to be let down from the top in ſevere weather, and taken up in mild. This certainly preſerves them, and yet does not draw them weak, or make them tender.

Cover the beds and boxes of ſeedling flowers, and take off the defence when the weather is milder,

Clean the auricula plants, pick off dead leaves, and ſcrape away the ſurface of the mould; put freſh mould in the place of it, and ſet the pots up to the brim in the mould of a dry bed, and place behind them a reed hedge.

Cover carnation plants from wet, and defend them from mice and ſparrows.

Kitchen-garden.

Throw up ſome new dung in a heap to heat, that it may be ready to make hot-beds both for the early cucumbers and melons, in this part of the ground, and for raiſing ſeeds of annuals in the flower-garden.

Dig up the ground that is to be ſown with the ſpring crops, that it may lie and mellow.

Nurſe the cauliflower plants kept under glaſſes carefully; ſhut out the froſt, but in the middle of milder days let in a little air; pick off dead leaves, and gather up the mould about the ſtocks.

Make a ſlight hot-bed in the open ground, for young ſallading, and place hoops over it, that it may be covered in very hard weather.

Plant out endive for ſeed into warm borders, earth and blanch celery.

Sow a few beans and peaſe, and ſeek and deſtroy ſnails and other vermin.

Orchard and fruit-garden.

Fruit-trees, whether in orchards, or eſpaliers, or againſt walls, demand the ſame general management.

Cut out dead wood and irregular branches, clean the ſtumps and boughs from moſs with a hollow iron; and repair eſpaliers, faſtening the ſtakes and poles with nails and wire, and tying the ſhoots down with twigs of oſier.

Place ſtakes by all new planted trees; and cut grafts to be ready, lay them in the earth, under a warm wall.

FEBRUARY.

Pleaſure-garden.

Make hot-beds for annual flowers, with the dung laid up for that purpoſe, and ſow them upon a good thickneſs of mould, laid regularly over the dung.

Tranſplant perennial flowers and hardy ſhrubs, Canterbury bells, lilacs, and the like. Break up and new lay the

the gravel walks. Weed, rake, and clean the borders, and where the box of the edging is decayed, make it up with a freſh plantation.

Sow auricula and polyanthus ſeeds in boxes: theſe ſhould be made of rough boards ſix inches deep, with holes at the bottom for the running off of water; they muſt be filled with light mould, and the ſeeds ſcattered thinly over the ſurface, then ſome more mould muſt be ſifted over them a quarter of an inch thick, and they muſt be ſet where they may enjoy the morning ſun.

Plant out carnations into pots for flowering.

Kitchen-garden.

Dig and level beds for ſowing radiſhes and onions, carrots and parſnips; and Dutch lettuce, leeks, and ſpinage, ſhould alſo be ſown now; alſo beets, ſalſafy, fennel, and marygolds, with any other of the hardy kinds.

Make up the hot-beds for early cucumbers, and ſow cauliflower-ſeeds, and ſome others.

Plant beans and ſow peaſe: the beſt way in theſe uſeful things is to ſow a new crop every fortnight, that if one ſucceeds, and another fails, there may ſtill be a conſtant ſupply at the due ſeaſon for the table. Plant kidney beans upon a hot-bed for an early crop. The dwarf, white, and Batterſea bean are the beſt ſorts. They muſt have air in the middle of mild days when they are up, and once in two days they muſt be gently watered.

Tranſplant cabbages, plant out Sileſia and coſs lettuce from the beds where they grow in winter; and plant potatoes and Jeruſalem artichokes.

Orchard and fruit-garden.

Moſt kinds of trees may now be pruned, though it be better to do it to the generality in autumn; whatever has been omitted at that ſeaſon in this article muſt be done now, that hardieſt kinds being pruned firſt, and ſuch as are more tender at the latter end of the month, when there will be little danger of their ſuffering from the froſt in the wounded parts.

Tranſplant fruit trees to places where they are wanted; opening a large hole, ſettling the earth carefully about their roots, and nailing them at once to the wall, or faſtening them up to ſtrong ſtakes. Nail up the tenderer trees with care, and uncover the fig-trees, by degrees, which have been protected from froſt by mats. Sow

the kernels of apples and pears, and the ſtones of plumbs for ſtocks, and keep off birds that eat the buds of fruit trees.

MARCH.

Pleaſure-garden.

Watch the beds of tender flowers, and draw mats over them ſupported by hoops, in hard weather.

Continue tranſplanting all the hardy perennial fibrous rooted flowers, ſweet-williams, golden rods, and the like. Dig up the earth with a ſhovel, about thoſe which were planted in autumn, and clean the ground between them.

All the pots of flowering ſhrubs muſt now be dreſſed. Pick off dead leaves, remove the earth at the top, and put freſh in the place, then give them a gentle watering, and ſet them in their places for flowering. In doing this take care the roots are not wounded, and repeat the watering once in three days.

The third week in March is the time to ſow ſweet-peaſe, poppies, catch-flies, and all the hardy annual plants.

The laſt week is proper for tranſplanting evergreens; and for this purpoſe a ſhowery day ſhould be choſen. New beds muſt be made to receive the ſeedlings of annual flowers raiſed in the former.

Kitchen-garden.

Sow in the beds of the kitchen-garden ſome carrots, and alſo the large peaſe, rouncivals, and grey.

In better ground ſow cabbages and ſavoys, alſo carrots, and parſnips for a ſecond crop; and towards the end of the month put in a large parcel of beans and peaſe.

Sow parſley, and plant mint.

Sow coſs and imperial lettuce; and tranſplant the finer kinds.

In the beginning of the month, ſow Dutch parſley for the roots.

The laſt week take the advantage of time, or the dry days, and make aſparagus beds.

Clear up the artichoke roots, ſlip off the weakeſt, and plant them out for a new crop, leaving four from each good root to bear; and from ſuch as are weaker two.

Dig up a warm border, and ſow ſome French beans. Let them have a dry ſoil; and give them no water till they appear.

Orchard

Orchard and fruit-garden.

The grafts which were cut off early, and laid in the ground to be ready for uſe, are now to be brought into ſervice: Thoſe of the earlieſt kinds are to be uſed firſt, and the apple laſt of all.

This done, look to the ſtocks that were inoculated the laſt year, and take off their heads. A hand's breadth ſhould be left on above the place; this holds the bud ſecure by tying to it, and the ſap riſes more freely for its nouriſhment.

The fruit trees that were planted laſt October muſt be headed; and they ſhould be cut down to almoſt four eyes. Some leave only three; but four is much better, the ſap riſes more freely.

APRIL.

Pleaſure-garden.

Tie up the ſtalks of tall flowers to ſticks; cut theſe two feet long, thruſt them eight inches into the ground, and let them be hid amongſt the leaves.

Clean and rake the ground between them.

Take off the ſlips of auriculas, and plant them out carefully for an increaſe. Tranſplant perennial flowers and evergreens as in the former months; and take up the roots of colchicums, and other annual bulbous plants.

Sow French honeyſuckles, wall flowers, and other hardy plants, upon the natural ground: and the tenderer kinds on hot-beds. Plant ſome tuberoſes in a moderate hot-bed; and ſow carnations and pinks on the natural ground or open borders.

Kitchen-garden.

Plant the large crop of French beans; and chooſe for them a dry warm border. Plants cuttings of ſage, and other aromatic plants. Sow marrowfat peaſe, and plant ſome beans for a late crop.

Sow thyme, ſweet marjoram, and ſavory.

Prepare dung for making ridges to receive the cucumber and melon plants deſigned for bell or hand glaſſes.

Sow young ſallading once in ten days; and ſow ſome coſs and Sileſia lettuces.

The ſeeds of all kinds being in the ground, look to the growing crops. Clear away the weeds every where

among them; and dig up the earth between the rows of beans, peaſe, and all other kinds that are planted at diſtances. This gives them a ſtrong growth, and brings them much ſooner to perfection than can be done by any other method.

Draw up the mould to the ſtalks of the cabbages and cauliflower-plants; and in cold nights cover the glaſſes over the early cucumbers and melons.

Orchard and fruit-garden.

Look to the fruit trees againſt walls and eſpaliers. Take away all fore-right ſhoots, and train ſuch as riſe kindly.

Thin apricots upon the trees, for there are uſually many more than can ripen; and the ſooner this is done, the better the others ſucceed.

Water new planted trees.

Plant cuttings of vines, and look over the grown ones. Nip off improper ſhoots. When two riſe from the ſame eye, always take off the weakeſt.

Weed ſtrawberry beds; cut off the ſtrings; ſtir the earth between them; and once in three days water them.

Dig up the earth in the borders near fruit-trees. Never plant any large kinds of flowers or kitchen things upon them: And it is better if nothing be ſown or planted on theſe borders; they all ſtarve the fruit.

MAY.

Pleaſure-garden.

Obſerve when the leaves of ſow-breads are decayed, and take up the roots, laying them carefully by till the time of planting.

Take up the hyacinth roots which have done flowering, and lay them ſide-ways in a bed of dry rich mould, leaving the ſtems and leaves out to die away; this practice greatly ſtrengthens the roots.

Roll the gravel-walks carefully and frequently, and keep the graſs clean mowed.

Clean all the borders from weeds: take off all ſtraggling branches, from the large flowering plants, and train them up in a handſome ſhape.

Plant out French and African marygolds, with other autumnals, from the hot-beds the laſt week of this month, chooſing a cloudy warm day.

The

Tie up the ſtalks of carnations. Plant cuttings of the lychnis and lychnideas, and ſow the ſmall annuals, candy-tuft, and Venus looking-glaſs, in the open ground.

Pot the tender annuals, as balſams, amaranths, and the like, and ſet them in a hot-bed frame till ſummer is more advanced for planting them in the open ground.

Kitchen-garden.

Water once in two days the peaſe, beans, and other large growing plants.

Deſtroy the weeds in all parts of the ground; and dig up the earth between the rows, and about the ſtems of all large kinds.

Sow ſmall ſallading once in ten days, as in the former month; and at the ſame time chooſe a warm border, and ſow ſome purſlain; ſow alſo endive, and plant beans and peaſe for a very late crop; and French beans to ſucceed the others. The great care in theſe kinds is to have theſe ſeveral products freſh and young throughout the ſeaſon.

Chuſe a moiſt day, and an hour before ſun-ſet plant out ſome ſavoys, cabbages, and red cabbage, draw the earth carefully up to their ſtems, and give them a few careful waterings.

Orchard and fruit-garden.

If any freſh ſhoots have ſprouted upon the fruit-trees and eſpaliers, or againſt walls, nip them off, and train the proper ones to the wall or poles, at due diſtances, and in a regular manner.

Look over the vines, and ſtop every ſhoot that has fruit upon it to three eyes beyond the fruit. Then train the branches regularly to the wall, and let ſuch as are deſigned for next year's fruiting, grow ſome time longer; their leaves will give a proper ſhade to the fruit.

Water the new-planted trees, and keep the borders about the old one's clear: and finally pick off ſnails, and other vermin.

JUNE.

Pleaſure-garden.

Chooſe the evening of a mild ſhowery day, and plant out into the open ground the tender annuals hitherto kept in pots in the hot-bed frames; they muſt be carefully looſened from the ſides of the pot, and ſhaken out with all the mould about them: A large hole muſt be opened

opened for each; they muſt be placed upright in it, and when ſettled in the ground by a gentle watering, muſt be tied up to ſticks.

Let pinks, carnations, and ſweet-williams be laid this month for an increaſe. Let the layers be covered lightly, and watered every other day a little at a-time.

The ſpring flowers being now over, and their leaves faded, the roots muſt be taken up, and laid by for planting again at a proper ſeaſon. Snow-drops, winter aconites, and the like, are to be thus managed.

The hyacinth roots, laid flat on the ground, muſt now be taken up, the dead leaves nipped off, and the mould; and when clean, they muſt be laid upon a mat in an airy room to harden, and then laid by.

Tulip roots muſt now be taken up alſo, as the leaves decay; and the like method muſt be followed with anemonies and ranunculuſes.

Cut the cups or pods of the carnations that are near blowing, in three or four places, that they may blow regularly.

Inoculate ſome of the fine kinds of roſes.

Kitchen-garden.

Tranſplant the cauliflower-plants ſowed in May. Give them a rich bed, and frequent waterings.

Plant out thyme, and other ſavoury plants ſown before, and in the ſame manner ſhade and water them.

Take the advantage of ſome cloudy weather to ſow turnips; and if there be no ſhowers, water the ground once in two days.

Sow brocoli upon a rich warm border, and plant out celery for blanching. This muſt be planted in trenches a foot and a half deep, and the plants muſt be ſet half a foot aſunder in the rows.

Endive ſhould alſo be planted out for blanching; but in this the plants ſhould be ſet fifteen inches aſunder, and at the ſame time ſome endive ſeed muſt be ſown for a ſecond crop. Pick up ſnails; and in damp evenings kill the naked ſlugs.

Orchard and fruit-garden.

Repeat the taking off of fore-right ſhoots upon wall and eſpalier trees, which we directed laſt month; and train proper branches to their ſituation, where they are wanted. Once again thin the wall fruit; leave nectarines

tarines at four inches diſtance, and peaches at five; none nearer. The fruit will be finer, and the tree ſtronger for next year.

Inoculate the apricots, and chooſe for this operation a cloudy evening. Water new-planted trees, and pick up ſnails and vermin.

JULY.

Pleaſure-garden.

Roll the gravel frequently, and mow the graſs.

Clip box edgings; cut and trim hedges; and look over all the borders, clearing them from weeds and ſtirring up the mould between the plants.

Inoculate roſes and jeſſamines of all the kinds that require this propagation; and any of the other flowering ſhrubs.

Take up the roots of fritillaries, and maragons, and others of this ſort, that are paſt flowering ſome time.

Gather the ſeeds of flowers you deſign to propagate, and lay them upon a ſhelf in an airy room in the pods. When they are well hardened, tie them up in paper-bags, and do not take them out of the pods till they are to be ſown.

Lay pinks and ſweet-williams, as the former, in earth. Cut down the ſtalks of thoſe plants which have done flowering, and which you do not keep for ſeeds; and tie up thoſe now coming into flower to ſticks, as we directed for the earlier kinds.

Sow lupins, larkſpurs, and the like, on dry warm borders, to ſtand the winter, and flower early next year.

Kitchen-garden.

Sow a crop of French beans to come in late, when they will be very acceptable.

Clear all the ground from weeds.

Dig between the rows of beans and peaſe; mow the ground alſo about the artichokes, and among the cabbage kinds.

Water the crops in dry weather.

Spinage-ſeed will be ready to be gathering now, as alſo that of the Welſh onion, and ſome others; take them carefully off, and dry them in the ſhade.

Take up large onions, and ſpread them upon mats to dry for the winter.

Clear

Clear away the ſtalks of beans and peaſe that have done bearing.

Watch the melons as they ripen, and give them very little water.

Water cucumbers more freely.

Orchard and fruit-garden.

Inoculate peaches and nectarines.

Take of all fore-right ſhoots in the eſpalier and wall fruit-trees.

Hang phials of honey and water upon the fruit-trees, and look carefully for ſnails. Keep the borders, where the fruit-trees ſtand, clear from weeds, and ſtir the earth about them. This will greatly aſſiſt the fruit in ripening.

Look to the fruit-trees that have been grafted and budded the laſt ſeaſon. See that there are no ſhoots from the ſtocks: Where-ever they riſe, take them off; for they will rob the intended growth of its nouriſhment.

Look carefully to the new-planted trees; water them often, and whatever ſhoots they properly make, faſten to the wall or eſpalier.

Repeat the care of the vines, take off improper ſhoots, and nail any that are looſe to the wall. Let no weeds riſe in the ground about them, for they will exhauſt the nouriſhment, and impoveriſh the fruit.

AUGUST.

Pleaſure-garden.

See whether the layers of ſweet-williams, carnations, and the like, be rooted; tranſplant ſuch as are, and give frequent gentle waterings to the others to promote it.

Dig up a mellow border, and draw lines at five inches diſtance, length-wiſe and a croſs: in the centre of theſe ſquares plant the ſeedling polyanthuſes, one in each ſquare.

In the ſame manner plant out the ſeedling auriculas. Shade them till they have taken root, and water them once in twenty-four hours.

Cut down the ſtalks of plants that have done flowering. Save the ſeeds you want, as they ripen.

Water the tender annuals every evening.

Sow anemonies and ranunculuſes, as alſo fritillary, tulip, and narciſſus ſeed.

Dig up a border for early tulip roots, and others for hyacinths, anemonies, and ranunculuſes. Sow annuals

to

to ſtand through the winter; and ſhift auriculas into freſh pots.

Kitchen-garden.

Sow ſome ſpinage upon a rich border, and on ſuch another ſow onions. Theſe two crops will live through the winter, unleſs very ſevere, and be valuable in the ſpring. The ſecond week in Auguſt ſow cabbage-ſeed of the early kinds; and a week after that ſow cauliflower-ſeed. This will afford the plants that are to be nurſed up under bellglaſſes in the winter. Some of theſe may alſo be ventured open in a very well-defended ſituation. The laſt week of this month ſow another crop, to ſupply the place of theſe in caſe of accidents; for if the ſeaſon be very ſevere, they may be loſt; and if very mild, they will run to ſeed in ſpring. Theſe laſt crops muſt be defended by a hot-bed-frame, and they will ſtand out, and ſupply deficiencies.

Sow lettuces, the cabbage and brown Dutch kinds, in a warm and well-ſheltered piece of ground.

Tranſplant ſome of the lettuces ſown earlier into warm and well-ſheltered borders.

Take up garlic, and ſpread it on a mat to harden; in the ſame manner take up onions and rockambole; and, at the latter end of the month, ſhalots.

Orchard and fruit-garden.

Watch the fruit on your wall trees, and keep off devourers, of which there are numberleſs kinds now ſwarming about them. Shoot all birds, pick up ſnails, and hang bottles of ſweet water for flies and waſps.

Faſten looſe branches, and gather the fruit carefully as it ripens.

Once more go round the vines, and pull off the trailing branches ſo very luxuriantly produced at this time. See that the fruit is not ſhaded by looſe branches, and keep the borders clear of weeds. This tends more than is imagined to the well-ripening of the fruit.

SEPTEMBER.

Pleaſure-garden.

A new kind of work begins this month; which is, preparing for the next ſeaſon. Tear up the annuals that have done flowering, and cut down ſuch perennials as are paſt their beauty, bring in other perennials from the

the nurſery-beds, and plant them with care at regular diſtances.

Take up the box-edgings where they are outgrowing their proper ſize, and part and plant them freſh.

Plant tulips, and other flower-roots.

Slip polyanthuſes, and place them in rich ſhady borders.

Sow the ſeeds of flower-de-luces and crown imperial, as alſo of auriculas and polyanthuſes, according to the method we delivered before.

Alſo, part the roots of flower-de-luces, piony, and others of theſe kinds. In the laſt week tranſplant hardy flowering ſhrubs, and they will be ſtrong next ſummer.

Kitchen-garden.

Sow lettuces of various kinds, Sileſia, coſs, and Dutch; and when they come up, ſhelter them carefully. The common practice is to ſhelter them under hand-glaſſes; but they will thrive better under a ſloping reed-hedge, ſuch as we deſcribed before.

Make up freſh warm beds with the dung that has lain a month in the heap. Plant the ſpawn in theſe beds upon paſture-mould, the ſame they were found in; and raiſe the top of the bed to a ridge, to throw off wet.

Look to the turnip beds and thin them; leave the turnips at ſix inches diſtance.

Weed the ſpinage, onions, and other new ſown plants.

Tranſplant ſage, lavender and ſweet plants. Earth up the celery as it grows up in height.

Sow young ſallading upon warm and well-ſheltered borders.

Clean aſparagus beds in this manner;—cut down the ſtalks, and pare the earth off the ſurface of the alleys, throw this upon the beds half an inch thick, and ſprinkle over it a little dung from an old melon bed.

Dig up the ground where the ſummer crops have ripened; and lay it in ridges for the winter. Theſe ſhould be diſpoſed eaſt and weſt, and turned once in two months; they have thus the advantage of a fallow.

Plant ſome beans, and ſow ſome peaſe on warm and well-ſheltered borders, to ſtand out the winter.

Orchard and fruit-garden.

The fruit muſt now be gathered with care, every day, and the beſt time is an hour after ſun-riſe. Then it ſhould

ſhould be laid in a cool place till uſed. Such as is gathered in the middle of the day is always ſlabby.

Keep birds from the grapes; for as they now begin to ripen, they will be in continual danger.

Tranſplant gooſeberries and currants; and plant ſtrawberries and raſberries; they will be rooted before winter, and flouriſh the ſucceeding ſeaſon.

OCTOBER.

Pleaſure-garden.

Let all the bulbous roots for ſpring-flowering be put into the ground, narciſſus, marragon, tulips, and ſuch ranunculuſes and anemonies as were not planted ſooner.

Tranſplant columbines, monkſhood, and all kinds of fibrous rooted perennials.

Place the auriculas and carnations that are in pots under ſhelter.

Some lay the pots on one ſide, but that ſpoils the bud for next year's flowering. The beſt way is by means of a ſloping reed-hedge. Dig up a dry border; and if not dry enough naturally, dig in ſome ſand. In this ſet the pots up to the brim. Place the reed hedge ſloping behind them, and faſten a mat to its top, that it may be let down in bad weather.

Take off the dead leaves of the auriculas before they are thus planted.

Bring into the garden flowering-ſhrubs where-ever they are wanted, and at the end of the month prune ſome of the harder kinds.

Kitchen-garden.

Plant out the cauliflower plants where they are to be ſheltered; and it will be proper to plant two for each glaſs, where that method is uſed, for fear of one failing.

Sow another crop of peaſe, and plant more beans; chooſe for theſe a dry ſpot, and well ſheltered from the cold winds of winter.

Tranſplant the lettuces ſowed laſt month, where they can be defended by a reed hedge, or under walls.

Tranſplant cabbage-plants and coleworts where they are to remain.

Take great care of the cauliflower plants ſown early in ſummer; they now begin to ſhew their heads; break

in the leaves upon them to keep off the ſun and rain it will both harden and whiten them.

Orchard and fruit-garden.

Prune the peach and nectarine trees, and the vine This is a very uſeful practice, for it ſtrengthens the bu for ſpring.

Cut grapes for preſerving, with a joint of the vine each bunch.

Gather fruits for winter-keeping as they ripen. Tran plant all garden-trees for flowering; prune curran buſhes, and preſerve the ſtones of fruit for ſowing.

NOVEMBER.

Pleaſure-garden.

Throw together a good heap of paſture ground, wit the turf among it, to rot for mould for the borders.

Tranſplant honeyſuckles and ſpireas, with other hard flowering ſhrubs.

Rake over the beds of ſeedling flowers, and ſtrow ſom peaſe-ſtraw over them to keep out the froſt.

Cut down the ſtems of perennials which have don flowering; pull up annuals that are ſpent, and rake an clear the ground.

Place hoops over the beds of ranunculuſes and anemo nies, and lay mats or cloths in readineſs to draw ov them in caſe of hard rains or froſts.

Clean up the borders in all parts of the garden, an take care to deſtroy not only weeds, but all kinds of mo

Look over the ſeeds of thoſe flowers, which were g thered in ſummer. See they keep dry and ſweet, and a condition of growth, and dig a border or two for th hardier kinds.

Kitchen-garden.

Weed the crops of ſpinage, and ſuch other kinds were ſown late; for the wild growth will elſe and ſtarve the crop.

Dig up a border under a warm wall, and ſow ſom carrots for ſpring. ſow radiſhes in another place, and ſ the ground be well and deep dug for both. Turn th mould that was trenched and laid up for fallowing; th deſtroys the weeds, and prepares the ſoil to be enriche by the air

Prepa

Prepare ſome hot-beds for ſallading. Cover them five inches with mould, and ſow upon them ſome lettuces, and the common ſmall ſallading, muſtard, rape, creſſes, and radiſh

Plant another crop of beans; and ſow more peaſe for ſucceſſion.

Trench the ground between the artichokes, and throw a thick ridge of earth over the roots. This will preſerve them from the froſt, and prevent their ſhooting at an improper time.

Make a hot-bed for forced aſparagus.

Take up carrots and parſnips, and lay them in ſand to be ready for uſe. Give air at times to plants under hand-glaſſes and in hot-beds, or they will ſuffer as much by want of that, as they would have done by the froſt.

Orchard and fruit-garden.

Stake up all trees planted for ſtandards, or the winds will rock them at the bottom, and the froſt will be let in and deſtroy them.

Throw a good quantity of peaſe-ſtraw about them, and lay on it a good quantity of brick bats or pebbles to keep it faſt; this will mellow the ground, and keep out the froſt.

Continue to prune wall-fruit trees, and prune at this time alſo the apple and pear kinds. Pull off the late fruit of figs, it would decay and rot the branches.

DECEMBER.

Pleaſure-garden.

Draw the mats and cloths over the ranunculus and anemony beds in ſevere weather, whether froſt or cold rains; but give them air in the middle of every tolerable day, and as ſoon as poſſible uncover them all day; but draw on the mats againſt night.

Throw up the earth where flowering ſhrubs are to be planted in ſpring; and once in a fortnight turn it.

Dig up the borders that are to have flower-roots planted in them in the ſpring; and give them the advantage of a fallow, by throwing up the ground in a ridge.

Scatter over it a very little rotten dung from a melon-bed, and after this turn it twice during the winter.

Look over the flowering ſhrubs and prune them. Cut away all dead wood, ſhorten luxuriant branches, and if

any croſs each other, take away one. Leave them ſo that the air can have free paſſage between them.

Sift a quarter of an inch of good freſh mould over the roots of perennial flowers whoſe ſtalks have been cut down, and then rake over the borders. This will give the whole an air of culture and good management, which is always pleaſing.

Kitchen-garden.

Plant cabbages and ſavoys for ſeed. This is to be done with great care; dig up a dry border, and break the mould very well; then take ſome of the ſtouteſt cabbage and ſavoy plants; hang them up by the ſtalks five days, and then plant them half way of the ſtalk into the ground, draw up a good quantity of the mould about the part of the ſtalk that is out of the ground, and make it into a kind of a hill round each; then leave them to nature.

Sow another crop of peaſe, and plant another parcel of beans, to take their chance for ſucceeding the others.

Make another hot-bed for aſparagus, to yield a ſupply when the former is exhauſted. Continue to earth up celery, and cover ſome endive with a good quantity of peaſe-ſtraw, as it is growing, that you may take it up when wanted, which otherwiſe the froſt will prevent.

Orchard and fruit-garden.

Prepare for planting trees where they will be wanted in ſpring, by digging the ground deep, and turning it well now in the place where they are to ſtand.

Scatter over the borders where the fruit-trees are planted ſome freſh mould, and ſome old dung, and in a mild day dig it in with a ſtrong three-pronged fork.

Look over the orchard trees, and cut away ſuperfluous and dead wood. Let the branches ſtand clear of one another, that the air can get between; and the fruit will be better flavoured.

This is the management of old trees, and new planted ones are to be preſerved by covering the ground at their roots.

Inſtructions how to pickle and preſerve, to make divers ſorts of Wine of our *Engliſh* Product; together with many excellent and approved Medicines, Salves, &c. neceſſary in all Families.

As many things have been ſpoken to, for the information of the younger ſort of the male kind, ſo it may not be amiſs to ſay ſome ſmall matter in relation to the inſtruction and benefit of the female kind. And,

I. *Of Pickling, Preſerving, Candying,* &c.

To pickle cucumbers.

WASH them, and dry them in a cloth; then take water, vinegar, ſalt, fennel-tops, ſome dill-tops, and a little mace; make it ſharp enough to the taſte; then boil it a while; then take it off, and let it ſtand till cold; then put in the cucumbers, and ſtop them down cloſe, and within a week they will be fit to eat.

To pickle cucumbers green.

Take two quarts of verjuice or vinegar, and a gallon of fair water, a pint of bay ſalt, a handful of green fennel or dill; boil it a little, and when cold, put it into a barrel, and then put the cucumbers to the pickle, and you may keep them all the year.

To pickle French beans.

Take them while young, and cut off the ſtalks; then take good vinegar, and boil it with pepper and ſalt; ſeaſon it to your palate, and let it ſtand till cold; then take the beans, and put them into a ſtone jar, placing dill between the layers, and then put in the pickle, and cover them cloſe for three weeks; then take the pickle, and boil it again, and put it to the beans boiling hot; cover them cloſe, and when cold they will be fit to eat.

Or, French beans may be pickled thus: Take your beans and ſtring them; boil them tender; then take them off, and let them ſtand till cold; then put them into pickle of vinegar, pepper, ſalt, cloves, mace, and a little ginger.

To pickle eldern, or any other buds of trees.

Give them one or two walms with vinegar, ſalt, whole pepper, long mace, and a little lemon-peel in pieces; then

then drain them, and let the buds and liquor cool ſeparately; afterwards put them into a jar, and cover them with your pickle.

To pickle walnuts to eat like mangoes.

Take green walnuts before the ſhell is grown to any hardneſs in them, pick them from the ſtalks, and put them into cold water, and ſet them on a gentle fire till the outward ſkin begins to peel off; then with coarſe cloths wipe it off; then put them into a jar, and put water and ſalt therein, ſhifting it once a-day for ten days, till the bitterneſs and diſcolouring of the water be gone; then take a good quantity of muſtard-ſeed, which beat up with vinegar, till it becomes coarſe muſtard; then take ſome cloves of garlic, ſome ginger, and a little beaten cloves and mace: make a hole in each nut, and put in a little of this; then take white-wine vinegar, and boil them together, which put to the nuts boiling hot, with ſome pepper, ginger, cloves, and mace, as alſo ſome of the muſtard, and garlic, which keep cloſe ſtopped for uſe.

To pickle muſhrooms.

Firſt blanch them over the crowns, and barb them beneath; then put them into a pan of boiling water; then take them forth, and let them drain; when they are cold, put them into your jar or glaſs, and put to them cloves, mace, ginger, nutmeg, and whole pepper: Then take white wine, a little vinegar, and ſalt; ſo pour the liquor into the muſhrooms, and ſtop them cloſe for uſe.

To pickle any ſort of flowers for ſallads, as clove-gilly-flowers, &c.

Put them into a gally-pot, with as much ſugar as they weigh: Fill them with wine-vinegar: To a pint of vinegar, a pound of ſugar.

To pickle ſamphire, broom-buds, aſhen-keys, purſlain, &c.

Take ſamphire, and pick the branches from the dead leaves; then lay it in a pot, and make a ſtrong brine of water and bay-ſalt: in the boiling ſcum it clean; being boiled and cold, put it to the ſamphire; cover it, and keep it for all the year; and when you uſe it, take and boil it in fair water, but the water muſt boil before you put it in; when it is boiled and become green, let it cool; then take it out, and put it into a wide-mouthed glaſs,

glaſs, and put ſtrong wine-vinegar to it, and keep it cloſe for uſe.

To pickle lemon and orange peel.

Boil them in vinegar and ſugar, and put them into the ſame pickle; obſerve to cut them into ſmall long thongs, then length of half the peel of your lemon: it ought to be boiled in water, before it is boiled in vinegar and ſugar.

To preſerve green apricots.

Take them when they are ſmall and tender; peel them, and put them in hot water, but let them not boil; let them lie there till they begin to be green; then take them out, and put them in cold water; then boil your ſugar, and let your apricots run a little of the water from them; then put them into the ſugar, and let them boil till the ſyrup becomes thick; then put them into an earthen pan, and let them remain there a week; then put them into a preſerving pan, and make them boil again till the ſyrup grows thick; then put them once more into an earthen pan, and let them ſtand till they are cold; then take them out of their ſyrup, and lay them on your ardoiſe; then dry them in your ſtove, and turn them often till dry; then put them in boxes on paper.

To preſerve fruit green.

Take pippins, apricots, pears, plumbs, or peaches, when they are green; ſcald them in hot water, and peel them; then put them into another water, not ſo hot as the firſt; then boil them very tender, and take the weight of them in ſugar, and put to them as much water as will make a ſyrup to cover them; then boil them ſomewhat leiſurely, and take them up; then boil the ſyrup till it be ſomewhat thick, and when cold put them together.

To preſerve raſberries.

Take good raſberries that are not too ripe, but very whole; take away the ſtalks, and put them into a flat-bottomed earthen pan: boil ſugar, and pour it over your raſberries; then let them ſtand to be cool, and when they are cold, pour them ſoftly into your preſerving pan, and let them boil till their ſyrup be boiled pretty thick, and

ſcum

ſcum them very well in the boiling; this done, put them in pots, and when cold, cover them up cloſe for uſe.

To preſerve barberries.

Take one pound of barberries picked from the ſtalks, put them in a pottle pot, and ſet it in a braſs pot full of hot water, and when they be ſtewed, ſtrain them, and put to the barberries, one and an half pound of ſugar, and to them put a pint of red roſe water, and boil them a little; then take half a pound of the faireſt cluſters of barberries you can get, and dip them in the ſyrup while it is boiling; then take the barberries out, and boil the ſyrup till it is thick, and, when cold, put them in glaſſes with the ſyrup.

To preſerve currants.

Lay a layer of currants, and then a layer of ſugar, and boil them as before preſcribed for raſberries; ſcum them in boiling till the ſyrup is pretty thick; then take them off, and when they are cold put them in gally-pots or glaſſes cloſely ſtopped.

To preſerve walnuts green.

Boil the walnuts till the water taſtes bitter, then take them off, and put them in cold water; peel off the bark, and weigh as much ſugar as they weigh, and a little more water than will wet the ſugar; ſet them on the fire, and when they boil up, take them off, and let them ſtand two days, and then boil them again.

To preſerve cherries.

Firſt, Take ſome of the worſt cherries, and boil them in fair water, and when the liquor is well coloured, ſtrain it; then take ſome of the beſt cherries, with their weight in beaten ſugar; then lay one layer of ſugar, and another of cherries, till all are laid in the preſerving pan; then pour a little liquor of the worſt cherries into it, and boil the cherries till they are well coloured; then take them up and boil the ſyrup till they will button on the ſide of a plate; and when they are cold, put them in a glaſs cloſe covered for uſe.

To candy cherries.

Take cherries before they be full ripe, and take out the ſtones: then take clarified ſugar boiled to a height, and pour it on them.

To candy pears, plumbs, apricots, &c.

Take them, and give every one a cut half through; then caſt ſugar on them, and bake them in an oven, as hot

hot as for manchet, cloſe ſtopped: Let them ſtand half an hour, then lay them one by one upon glaſs-plates to dry, and they will appear very fine and clear. In this manner you may candy any other fruit.

To candy flowers.

Pick them very clean, and to every ounce of flowers put two ounces of hard ſugar, and one ounce of ſugar-candy, and diſſolve them in roſe-water; then boil them till they come to ſugar again, and when it is almoſt cold, put in your flowers, and ſtir them together, *&c.*

II. *Of making ſundry ſorts of* Engliſh *Wines.*

Currant wine. Pick the currants, when they are full ripe, clean from the ſtalks, then put them into an earthen veſſel, and pour on them fair and clean hot water, a quart of water to a gallon of currants; then bruiſe or maſh them together, and let them ſtand and ferment; then cover them for twelve hours, ſtrain them through fine linen into a large earthen jar, and then put the liquor into a caſk, and thereto put a little ale-yeaſt, and when worked and ſettled bottle it off: This is exceeding pleaſant, and very wholeſome for cooling the blood: in a week's time it will be fit for bottling.

Artificial claret. Take ſix gallons of water, two gallons of the beſt cyder, and thereto put eight pounds of the beſt Malaga raiſins bruiſed; let them ſtand cloſe covered in a warm place for two weeks, ſtirring them every two days well together; then preſs out the liquor into a veſſel again, and add to it a quart of the juice of barberries, and a pint of the juice of the bramble-berries or raſberries, (which perhaps is the beſt) to which put a pint of the juice of black cherries; work it up with muſtard ſeed, covered with bread-paſte for three or four days by the fire-ſide; after which let it ſtand a week; then bottle it off, and it will become near as good as, if not exceed, common claret.

Gooſeberry wine. The beſt way is to take to every three pounds of fruit, one pound of ſugar, and a quart of fair water. Boil the water very well, but you muſt put the aforeſaid quantity of ſugar when it is boiled: Bruiſe the fruit, and ſteep it twenty-four hours in the water; ſtir it ſometimes, then ſtrain it off, and put the ſugar to it, and let it ſtand in a runlet cloſe ſtopped for a fortnight; then

draw

draw it off, and ſet it up in cool cellar, and in two months it will be fit to drink.

Raſberry wine. Take the raſberries clear from the ſtalks; to a gallon of which put a bottle of white wine, and let them infuſe in an earthen veſſel, two or three days cloſe covered; then bruiſe the berries in the wine, and ſtrain through fine linen gently; then let it ſimmer over a moderate fire, ſcum off the froth, and then ſtrain it again, and with a quarter of a pound of loaf-ſugar to a gallon, let it ſettle: Then in half a pint of white wine boil about an ounce of well-ſcented cinnamon, and a little mace, and put the wine ſtrained from the ſpice into it, and bottle it up.

Damſon wine. Dry the damſons in an oven after you have drawn your bread, then to every quart of damſons put three quarts of fair water, but firſt boil it very well; then put the water and damſons into a runlet with ſugar, and having ſtood a time ſufficient, bottle it off.

Wine of grapes. When they are fully ripe, in a dry day, pick off thoſe grapes that are ripeſt, and ſqueeze them in a vat or preſs made for that purpoſe, in which, muſt be a fine canvas bag to contain the grapes; and when in the preſs, do not ſqueeze them ſo hard as to break the ſtones, if you can help it, becauſe the bruiſed ſtones will give the wine a diſagreeable taſte: Then ſtrain it well, and let it ſettle on the lees, in ſuch a caſk or veſſel as you may draw it off without raiſing the bottom; then ſeaſon a caſk well with ſome ſcalding water, and dry it or ſcent it with a linen rag dipped in brimſtone, by fixing it at the bouge, by the bung or cork; then put the wine into it, and ſtop it cloſe for 48 hours; then give it vent at the bouge, with a hole made with a gimlet, in which put a peg or faucet that it may eaſily be moved with the fingers; then in about two days time cloſe it up, and in about two or three months time it will be fit for drinking, and prove almoſt as good as French wine.

Wine of ſtrawberries or raſberries. Maſh the berries, and put them into a linen bag, as above ſaid, for the grapes, and ſqueeze them into a caſk, and then let it work as aforeſaid in the grape receipt, *&c.* In this manner may cherry wine be made; but then you muſt break the ſtones, contrary to what was ſaid concerning the grapes.

A ſhort

A ſhort way for cherry wine. Squeeze the juice of cherries into a caſk, and thereto put a ſmall quantity of ſugar, correſponding to the quantity of juice; and when it has ſtood a month, it will be a pleaſing liquor.

Black cherry wine. In the ſame manner, take a gallon, or more, of the juice of black cherries, and keep it in a veſſel cloſe ſtopped, till it works; and after it is fine, add an ounce of ſugar to each quart, and a pint of white wine.

To make cyder. Grind, ſtamp, or pound your apples, and put them into a preſs, and ſqueeze them through hair bags into a tub; and let it ſettle, and, according to your quantity of juice, put in ſome ſugar at diſcretion; then work it up with ale-yeaſt, and let it ſtand a week; then prepare your veſſels according to the quantity, clean and dry: then put it up; after which put into a bag two pounds of ſtoned raiſins, two ounces of whole ginger, and two ounces of iſing-glaſs, and ſee it tied tight with a ſtrong ſtring fixed without-ſide the barrel, that the bag may ſink to the bottom; and after two months it will be fit for uſe.

Mead. Take ſix gallons of water, and thereto put ſix quarts of honey, ſtirring it till the honey be thoroughly mixed: then ſet it over the fire, and when ready to boil, ſcum it very well: then put to it one quarter of an ounce of mace, and as much ginger, and half an ounce of nutmegs, ſome ſweet marjoram, thyme, ſweet briar, together, a handful; then boil them in the liquid, then let it ſtand by till cold, and then barrel it up for uſe.

Of jellies. Let them be of apples, currants, raſberries, *&c.* Take out the clear liquor, (when ſqueezed) and boil it with ſugar till it is as thick as a jelly; then put it up in glaſſes.

III. *Family Medicines.*

Almonds of the ears fallen down. Take a little bole armoniac in powder, and with it mix ſome Venice turpentine, and ſpread it on ſheep's leather, as broad as a ſtay, and apply it under the throat from ear to ear.

Ague. Drink the decoction (that is the boiling of any herb) of camomile, and ſweeten it with treacle; which drink when warm in bed, and ſweat two hours. Or, to the wriſts apply a mixture of rue, muſtard, and chimney-ſoot by way of plaiſter.

Aſthma,

Aſthma, or ſhortneſs of breath. Take a quart of aqua-vitæ, one ounce of anniſeed bruiſed, one ounce of liquorice ſliced, half a pound of ſtoned raiſins, and let them ſteep ten days in the above-mentioned; then pour it off into a bottle, with two ſpoonfuls of fine ſugar, and ſtop it very cloſe.

St. Anthony's fire. Take a purge, and anoint the place with the marrow of mutton.

Bruiſe or ſcald outward. Take a quart of neats-foot oil, half a pound of red lead, two ounces of bees wax; boil them together three hours, and ſtir them well.—Or, oil of eldern, bathed or rubbed on the place, will have the ſame effect.

Bruiſes inward. Drink the decoction of comfrey with bread and butter.

Bound in the body. Take cream of tartar, mixed with honey, very frequently.

Piles or ſores. Eat roſemary and ſage with bread and butter, and apply wheat flour and honey by way of plaſter.

Bloody-flux. Take as much linen cloth as will make a ſuppoſitory; being wrapped round button wiſe, wet it in the beſt aqua-vitæ, or aqua compoſita; which properly applied, will help them in two or three applications. This is an approved and ſure medicine.

Bleeding at the noſe. Put into your noſtrils coney wool rolled in bole-armoniac.

To purge the blood. Drink often of the tea of ground-ivy, or of ſaſſafras chips.

Canker in the mouth. Take the juice of plantane and roſe-water mixed, and with it frequently waſh your mouth.

For a cough. When you are going to bed, drink brandy, treacle, and ſallad-oil, mixed; or, take a mixture of butter and brown ſugar.

Convulſions in children. Take unſlaked lime one quart, and to it put five quarts of ſpring-water; let it ſtand 24 hours, in which time ſtir it three times, ſcum it, and take the clear water, and let it ſtand 12 hours more, and ſtrain it through a cloth; and, being put into an earthen pot, put to it anniſeeds and fennel ſeeds of each a quarter of a pound; liquorice bruiſed, and ſaſſafras, of each an handful: let them ſtand four or five days, and then

then let the child drink a quarter of a pint morning and evening, as long as it laſteth.

Conſumption. Take as much new milk as a common ſtill will hold, to which put the herbs following, *viz.* hyſſop, cowſlip-leaves, horehound, and colt's foot, of each an handful; and of maiden-hair one ounce; let them ſtand all night, then ſtill them off; and when it is to be drank, ſweeten it with ſyrup of cowſlips, or good ſugar.

Colic. Beat the hips of wild roſes (gathered in winter) into powder, and half as much ſliced nutmeg; mix them, and take ſome in all your drink: this is an excellent remedy.

To cure drought in the ague. Take a ſmall quantity of burridge, ſorrel, violet-leaves, and ſtrawberry-leaves; ſeethe them in two quarts of fair running water, till it conſume to one quart; then take almonds and blanch them, and when beaten, put them to the ſaid water, and to it put a little ſugar, and drink it warm.

Dropſy. Take broom aſhes, and muſtard-ſeed, ſteeped in a pint of white wine; of which drink often. *Approved.*

For a ſore throat. Take columbines and cinquefoil, ſtamp them and ſtrain them into milk, and drink it very warm.

For the gripes. Take a ſliced nutmeg in a quartern of brandy warmed over the fire; to which put the beaten yolk of an egg, with a little water or ſugar; ſtir them together over the fire to thicken a little: take it at night going to bed.

For the ſtone, or ſtoppage of urine. Take a quantity of thyme, parſley, tops of fennel, and cinquefoil a little quantity, five or ſix cloves of garlic; ſtamp them all together, and ſtrain them into white wine or ale, and drink of it morning and evening.

To cauſe an appetite. Seethe centaury in fair water, and drink it in a morning faſting, to the quantity of nine ſpoonfuls, lukewarm, for three days

An eaſy and ſafe purge. Take cream of tartar one ounce; jalap and brimſtone, of each a quarter of an ounce: the jalap muſt firſt be beaten into fine powder; and mix them thoroughly together in a mortar; but if the perſon be hard to work on, put two drams of jalap more.

Small-pox. When warm in bed, drink mulled ale with marygold-flowers, and ſweat a little to bring them thoroughly out; and to keep them from ſinking, take brimſtone and treacle.

For the itch. Take frankincenſe, and beat it ſmall, and mingle it with oil of bays, and therewith anoint all over.

For a burn or ſcald. Take oil of elders, and anoint the place: this is a ſure remedy.

Againſt the fever. Take a handful of bay-leaves, and a large handful of red ſage; ſeethe them in two quarts of ale, till they come to one, and let the patient (being in bed) drink thereof a good draught warmed with a little ſugar.

To make an approved ointment for old aches, &c. Stamp ſmallage, and add to it ſome aqua-vitæ, and boar's greaſe, ſtir them well together, and anoint the place before the fire evening and morning

To make melilot excellent for plaiſters. Take melilot, pimpernel, and ſcabious, of each two handfuls; cut them ſmall, then beat them in a mortar with two pounds of hog's lard; let it ſtand in the ſun-ſhine ſeven or eight days, (it being uſually made in June) then melt and ſtrain it well; then add as many more freſh herbs, and ſet it in the ſun as before, and then melt and ſtrain it again; then boil it till the juice is conſumed; then take it off the fire, and put to it beaten roſin, bees wax, and Venice turpentine, of each an ounce; when cold, put it up in pots, or make it up in rolls.

A Monthly Liſt of all the Fairs in England and Wales; in which all the moveable Fairs are fixed to their certain Days.

JANUARY 1. Charlbury 5 Redbourn 8 Preſton 10 Cauſton Dronfield Sleaford 11 Howden Saliſb. 13 Landovery 14 Lavenog Nottingh 15 Pontefract 17 Buckingh Taviſtock 18 Bonwell Grampound Melton-mowbray Potton Teighmouth 20 Banbury 22 Banham 24 Snefford 25 Bingly Bodmyn Briſtol Cheſterfield Churchingford Kington Leighton (Bedf) Plymouth Weaſenham Whittleſea (Iſle of E.) 26 Adwalton Knareſborough Leek 27 Rippon 28 Langollen.

February 1. Higham-Ferrers Reading 2 St Blazey Eveſham Farringdon Lifton Lyme Lynn Mart Poult Rudland Saltaſh Wymondham 3 Bale Bath Bromeley Dereham

Dereham Ermington 5 Lanerchymeadd Pontefract 7 Capel St Silin Howey 8 Chirk Egton Hereford Stamford 9 Llandaff 10 Chapelin-le-Firth Beverley 11 Leyburn Llandyſell 12 Dorcheſter 14 Aſhborne Beconsfield Beaumaris Biddeford Biggleſwade Brandon Budworth Camraſs Cardigan Deviſes Flint Frampton Godalming Hambledon Headon Leominſt Looe Maidſtone Mold Northallerton Slaidburn Tutbury 17 Bridgnorth Congleton Stafford Workinham 18 Long-Preſton 19 South-Molton Weldon 21 Berkhamſtead Bingham Coleſhill, (Staff. and Warw) Liſkeard Litchfield Northampton Thirſk 22 Botley Bury (Lanc) Caegwrly Danbury Hartley-Row Stone Tregony 23 Bildeſtone Campden Dunſtable Eton Exeter Falkingham Royſton Tetbury Tunbridge 24 Banbury Cambrone Eglewyſfach Frome Henly (Oxon) Ireby Pocklington Stoke (Suff.) Teignmouth Walſhall 25 Aſhbrittle Burnham (Bucks) Carnary Derby Feverſham Llanerillo Llandfechel Oundle Plympton Ruabon Weſtbury 26 Adwalton 28 Abingdon Chertſey Cheſterfield Winton.

March 1. Aldeburgh Bedf. Colyford Seaton 2 Baldock Brackley Liphook 3 Aſhburton Bridgwater Fincham 4 Charlbury Frampton Graffington Stockport 5 Bolingley Tichfield Tregarron Wantage, Weſt-Looe 7 Aberfraw Blandford Bourn Buckingham Burnley Chipping-Norton Corſham Frampton Higham-Ferrers Hingham Kirby-Stephen Langport Nottingham Tewkſb Uppingham 10 Norton 11 Camelford Llandegla 12 Gorwen, Langadock Mydrim South-bourn Sudbury Talgarth (Yorkſh) 14 Bradford (Yorkſh.) Llandewy Northop Poole Seaford Stamford 15 Bradford (Yorkſh.) Burnham (Norf.) Oakham Oſweſtry 16 Bettws Caeirwyth Knareſborough 17 Abbots-Bromley Llangollen Malmſbury 18 Llanuſydd 19 Helſton Market-Jew Ruthen Shrewſb 21 Cerne Fazely Mold Narbeth Philips-Norton Saliſb Sedbergh Stamford Worksop 22 Caſtlecarry Howden Leominſt Oakhamp Stone (Staff) 23 Aylſham Dolton Retford Skipton Truro Wrexham Wooburn 24 Bromyard Clithero St Columb Eccleſhall Keynſham Rippon Upton Wye 25 St Alban's Aſh Axbridge Biſhop's-Leydeard Caerphilly Chagford Churchingford Earls-Colne Grampound Great-chart Henly (Warwickſh) Huntingdon Malpas Midhurſt Newark Oxborough Rudland Stock-

port Watlington Wigton Woodſtock Woodbridge 26 Andover Bodmyn Feckenham Hertf Montgom. Namptwich Odiham Walden 28 Grantham Liſkeard Loughborough Magor Patrington Philips-Norton Preſton (Lanc) Wiſbeach (Iſle E.) 29 Alceſter Chapeline-le-Firth Llangerniew Newn Stourbridge Wellington (Salop) 30 Market-Drayton 31 Durham Newbridge Ottery Settle Yarm.

April 1. Biſhop-Caſtle Reeth Snaith Stevenage 2 Abergely Alnwick Ayleſbury Helſtone Hitchin Llanidloes Lutterworth Malton Newport (Shropſh) Richmond Shafteſbury Skipton Wiſbeach (iſle E.) Worceſt. 4 Aſhborn Belbroughton Cheſterf Elham Falkingham Frettenham Ledbury Magor Minſter Nefyn Pool (Montgom) Swindon Ulpho 5 Bangor Blithburgh Bottle Bridport Budworth Burton Cardigan Clack Colinbrook Deal Ditchling Doucaſt Elmham Glouceſt Hailſham Itchwell Kingſclear Lamberhurſt (Kent) Lavendon Ludlow Morton St Peter's Potton Plympton Somerton Southwich Tarring Thirſk Trecaſtle Wadley near Farringdon Wallingford Wickwater 6 Abercon-way Ivinghoe Kington Llanwylling Newen Uffculme 7 Atherſtone Chapeline-le-Firth Llandyſell Malmſbury Maſſingham Norwich Nottingh Southminſter Wareham Wellington (Somerſetſh.) 8 St Auſtle Droitwich Grinton-Hackfield High-Budleigh Winbourn Settle 9 Burnley Pontefract Skipton 11 Attleburgh Bakewell Barnard-Caſtle Boxford Cokerham Darlington Dilton-March Little-Driffield Elham Emſworth Fringinghoe Gresford Guiſburn Haleſowen Hockham Kegworth Kelvendon Kerſey Loddon Manewden Mitchel-Dean Newcaſtle (Staff.) Olney Romſey Shefford Sleaford Thornbury Warminſter 12 St Aſaph Aſhby-de-la-Zouch, Baſingſtoke-Downs Bedale Blakney Brailes Brede Chipping Cirenceſt Clare Cloeaynog Colcheſt Daventry Dedham Dorcheſt (Oxon) Fordſtreet Frewn Gainſborough Godmancheſter Jeventon Milverton Newport (Eſſ.) Perſhore Piddletown Rochford Sanbach Scole Scotto Selbey Sidmouth Skipton Slaugham Slinford Tamworth Thame Thorncomb Totneſs Toulſham Turner's-Hill Windſor 13 Aſhill Hartland Heref Holy-croſs Leek Otterton Redbourn Roy-ton Walton Wellingborough Witheridge 14 Adwalton Beccles Carſtreet Cawſtone Cheltenham Cricklade Dronfield

Dronfield Kettering Stamfordham Whitney 15 Barnſtable Beaulieu Derby Northamp Rothbury Slaidburn Tangley Yarmouth (Norf.) 16 Biggleſwade Brackley Yarm (Norf.) Worceſt 18 Caſtle-acre Eveſham Llanelliom Padſtow 19 Blockley Eleſmere Fenny Stratford Skipton 20 Downton Northleach Llandovery Shrewſb Stoney-Stratford 21 Bedf Cheſham Stampford Peverell 22 Allechurch Bury (Lanc.) Newport-Pagnell Pontypool Settle 23 Great-Bedwin Bilſden Biſley Camden Chicheſt Cowbridge Finchamſtead Graveſend Hatfield Holywell Iron-acton Modbury Norleaſe Sawbridgeworth Staraway Whitechurch (Hants) 25 Aſhover Axminſt Brachnell Burnham (Eſſ.) Crowborough Graſſington Guiſborn Holt (Norf.) Iron-acton King's-Norton Lannerchymeadd Limpſham Llandegla Llanerwſt Loughborough Luton Maiden-Bradley Methwould Montacute Great-Oakly Orleton Pocklington Southampt Stogumber Toddington Warkworth Wigmore 26 Caerwith Ovingham Settle Somerton Tamworth Tenbury 27 Abberford Burrowbridge Cerrigy Drindion Dorſton Downham Holeſworthy Spalding 28 Adwalton Soham 29 Churchingford Newchurch Reeth 30 Chapeline-le-Firth South-Moulton Newmarket, (Flintſh.)

May 2. Little-Brickhill Burnham (Bucks) Caſtlecarry Charing Cleobury-Mortimer Cockermouth Collyton Coventry Crowcomb Collumpton Derby Fowey Giſborough Greenſtreet Harwich Hazlemere Hope Lancaſt Lantiſſent Laxfield Loweſtoffe North-Petherton Oldham Penryn Reading Redruth Ruffard Shoreham Stockport Stogurſey Stonehouſe Tarperly Totneſs Weſt-Haden Wingham Wirkworth Witterſham 3 Addleburgh Barton Underwood Broadcliff Bromyard Caſtle-Heddingham Chard Colnbrook Hambledon Heitſbury Higham-Ferrers High-bickington Poulton Tidſwell Tregony Worſtead 4 Amphthill Bewdley Boſton Brecon Callington Caſtlecoome Chagford Chedder Cheſterf Earith Elmſtead Frodſham Goſp Guilf Harling Henfield Hodnet Ipſw Lidney Northallerton Northamp North-Duffield Nutley Overton Probus Shapp Tamworth Tanby Torrington Wilton Woburn Wooler Wotton-Baſſet Wrotham 5 Caxton Chorley Llandrhiader Pentraeth Mon Porloch Tenterden 6 Amberſbury Biſhop's-caſtle Bourn Brigſtock Buckingham Calne

Caſtletown Chawley Chipnam Chipping-Norton Coleſhill (Staff. and Warw.) Dunmow Durſley Gwthrin Halſtead Hunmanby Kendal Knareſborough Knighton Lewes Liſs Llanerchymeadd Macclesfield Meer Nantaglyn Oakham Pensford Pleaſly Riſborough Stallbridge Settle Stoke Under-Hambden Taviſtock Treganatha Uttoxeter Wem Wymondham 7 Talybout 9 Braintree Crawley Deheuidd Dudley Guiſborn Hawarden Haſſingden Holdty Horſebridge Highley Market-Boſworth Matlock, Padiham Stamford Tockington 10 Allentown Caerleon Egton Fring Harold Leigh E. Skipton Solyhull 11 Aſkrig Crediton Dewſbury Dolegelly Eglwysfach Llanidlos Staines Worley-common 12 Adwalton Alfriſton Alnwick, Andover Bagbor *Weſt*-Barnſley Brading Burgh Burwaſh Cawood Chelmsf Coln Congleton Corſe-caſtle Crickhowel Everſhot Ewell Falkingham Haverford-weſt Haverhill Hertford Lamborn Llanufydd Lavichangel Ledbury Leiceſter Lighton (Huntingtonſh) Linfield Lingfield Litchf Little-mountain Lymington Maidſt Milthorp Mold Pain's-caſtle Pembridge Pentre, Penybert Rippon Rowland's-caſtle Sherſtone Silſoe Smith Stanſtead St Stephen's Stoke (Suff.) Storrington Stowe (Glouceſterſh) Stroud Sturminſt Swaffham Trefrhiw Touchest Tuxford Wadebridge Warwick Wendover Wenlock Wiviſcomb 13 Blackheath Brent Burnley Darley Flaſh Haverhill Llanſawel Leominſter Leybourn Oſweſtry Pwllhely Rippon Sucklebridge Waltham H 14 Abergavenny Arundel Bala Berkley Brans-Burnton Bungy Chelmsf Chertſey Denbigh Elſtow Fairford Goldanger Guiſbourn Haltwiſtle Hanſtreet Harrlepoole Halloway Newark Nuneaton Oakhamp Pembroke Pulham (Norf.) Ramſbury Rochdale Staff Strafford (Warwickſh) Stretton-Church Tatterſhal Tewkſbury Thetf Titchfield Townyn Ucfield Waltham-abbey Weighton Winchelſea Woobridge 16 Benenden Bettws Caergwrley Carnarvon Chatham Everſley Guiſborn Inglewhile Llanernigew Machynleth Overton-Roach Winchcombe 17 Aſhford Brentford Bolney Emergreen Groombridge Hay Holebeach Mattiſhal North-moulton Newton (Lanc) Penrice Rudham Somerton 18 Abergeley Alceſter Brentford Dorſtone Handford Kingſbrumpton Leek Llandfannan Morpeth Northleach Weſtfield Walſingham Workington 19 Attleburgh Banbury Bawtry Beaconfield Beaumaris

Eccles

Beccles Beverly Bideſtone Biſhop-Awkland Blyth Bottiſhall Bovey-Tracey Bow (Devon) Brentford Bridge-end Bridport Brighthelmſtone *Bures Burton* Chappel-Cannon Cerne Chapeline-le-Firth Cheidle Cheltenham Danehill Devizes Dicker Eccleſhall Ely Eglewyſwrw Farnham Finden Framſden Garſtang Grantham Hallaton Hanſlope Hawkſhead Helmſley-*Black*-Moor Hereford Hundon Kidderminſter Kilhampton Kirkbylonſdale Langodock Lifton Linton Liſkeard Llanely Mendleſham Middlewich St Neots Newbury Newport (Monmouthſh,) North-Walſham St Oſyth Petworth Rippon Roſs Saxmundham Scarbor. Shefford Southwich Stelling Stockbridge Stone (Kent) Stortford Stratton Summer-Court Three-Lords Trew Ulverſtone Wellington (Somerſ) Wemb' Weobly Wetherby Wigan Winſlow Woodneſborough Wrexham Yarm. Yaxley 20 Charbury Rockham Southminſter Stevenage St Udney Wellow Wickham 21 Aſhbourn Blackburn Culmſtock East-Church Hatherleigh Lamberhurſt (Suſſex) Sellinge Sherborn Sputtey Trecaſtle Wainfleet Weldon Whiteſmith 23 Abbots-Broomley Albrighton Appleſhaw Braſtead Bridlington Broomhall Criccieth Dorking Dunſtable Fletching Grays Gueſtling Hallaton Hindon Horſham Llandwnnog Maenclochog Preſton (Kent) Ruabon Sodbury Spilſby Swindon Thorpe Wiſbeach (iſle E.) Witham Wragby 24 Belford Corwen Huddersfield Kidwely Lanvylling Louth Mark Marſhfield Teſtiniog Wood's-Corner 25 Abberford Bodmyn Cuck-field Market-deeping Newent Standhurſt Shrewſb Spaldick 26 Alſton Aſtwick Brough Camelford Donnington Kirkoſwald Malmſbury 27 Chipping-Norton Horſted Keynes Pett Ruthyn Thaxſtead 28 Appleby *Booth* St Germain's Malton Nefyn Newport (Salop) Norwich Skipton Stagſhawbank Wiſbeach (iſle E.) 30 Ackhole Amerſham Appleby Ardingley *Bakewell Battle* Berkhamſtead *Biggleſwade Billingſhurſt Binegar Blackburton Braughing Brixworth Broomyard* New-*Buckingham Bury* Cartmell Chicheſter Coltiſhall Cranbrook Cromer Crowle Darlington Little-Dean Little-Driffield Dunſter Eltham Eveſham Exeter, Eye Framlingham Hadleigh Ham near Richm Harlow Hawes Helſtone Hempnall Hitchin St Ives, (Hunt) Kington Landaff Launceſton Lawhaden Llanymyneck Manchest March in the iſle of

Ely

Ely Mayfield Newcaſtle Staff.) Newport (Hants) Ormſkirk Oundle Portbury Rocheſt Roſleyhill and every fortnight after till Sept. 29 at ditto, Rothbury Rotherham Ruiſhton *Saliſb Sittingbourn Sleaford Southwell Spilſby Stockſb* (*Suff.*) Tarling Tollerdown Turkſey Walſingham Wandſworth Warſop Wellingt (*Suff.*) Wells Weſtbury (Wiltſh.) Weſt-Hoathly Whitechurch (*Salop*) Whitedown York 31 Alford Aſhby-de-la-Zouch *Bampton* (Devon) *Bedale Binegar Botley Boxtead Buckland* Caſtlecarry Coggleſhall Cuckfield Durham Eaſtchurch Eleſmere Elemſett Epping Farringdon Giſborough Hatfield-Pavarel Haſtings Hempton Henley (Warw.) Hingham Great Holingbury near Woodſidegreen Landovery Leighton (Bedf.) Lewes Llangollen Melford Melton Mowb. Midhurſt Monmouth Newark Newmarket (*Suff.*) Ottery Painſwick Pembury Penrith Purleigh Rochdale *Saliſb* Stone (*Staff.*) Talgarth Tenby Tillingham Walderſhare Walſhall Wandſworth Warnham Wetwoodbank near Wooler Weſt-Merſey Woodſtock Yardley.

June 1. Ambleſide *Barnard*-Caſtle *Baſingſtoke* Caiſter Kirkby Muir-ſide Lampeter Leek Lenton near Nottingham Llandibea Ludlow Maidenhead Minehead Newick Redbourn Royſton Steple *South*-Harting Truro Wanſworth Wellingborough 2 Adwalton Alphington Aſhburton Aſkrig St Auttle *Birmingham Bow* (Midd.) Buckingh Dinaſmonddy Henley (Oxon.) Kingſton Langtown Latchington Newport (Monm) Odell Upton Weſt-Cowes 3 Bow (Midd) Carmarthen Chepſtow Derby Hurſt-Green Kingſton Merſham Rye-gate 4 Balcomb Booth Kingſt Kirkham Y. Morton. Hamſtead Narbeth Norwich Stockeſley Stowbridge 6 Althorn Bojam Bradford Burnham *S South* Cave Dalton Daventry Dorcheſter Gillingham Great-Tey Hampton Hounſlow Lenham Meſſingham Milbourn-Port Oſtend Pembroke Pontypool Pool (Montgom) Rayleigh Rowell Rudgwick Scale *Southamp Southwould Sutton* Toddington Uſk Watford Williton Windſor 7 Abergavenny Holywell Montgom *Sheffield Somerton Sutton H. Swinehead* Watford Wetton 8 Aberfraw Ravenglaſs 9 Caerwyth Carphilly Chapline le-Firth Chirk Chriſt-Church Harlech Kidderminſter Kilkhampton Llanerchymeadd Neath Penzance *Steying Stortford* Thorpe near Egham Weobly 10 Berw. Coventry Ingham Pentraethmon

Pentraethmon Teſtinivg 11 Amerſbury Axbr Brandon Chipman Chudleigh Gaywood Grampound Llandwitt Liphock Menchinot Newnham (Glouc.) Overton Stanford Stanton Stratf Toleſham Darey Workingham 13 Banbury Barton (Linc) Belton L. Bines-green Clunn Darlingt Devizes Hallaton Haverford-weſt St Neot's Preſcot Roſs Whittle-ſea (iſle E.) 14 Ayleſb Hailſham 15 Brampton Manningtree South-Moulton Ramſey 16 Falkingh Frogatheath Polſtead Wrexham 17 St Alban's Bradfield Grimſby Taunton Thorne 18 Chepſtow Rothersfield Stockland 20 Abingd Coleford Howey Maidſt. Stamford Whitechurch (Hants) 21 Addleburgh Biſhop-Awkland Landillos Lanwrſt Newbrough Tiverton Worksop 22 Appledore Bradfield Bettws Bletchingley Brampton Broadwater Burrough-bridge Croſs-in-hand Haleſowen Hatherleigh Havant-hole (Denb) Horncaſtle Lambertcaſtle Ledb Macclesf Newburgh Newcaſtle (Caerm) Newport-Pagnell Selby Shipton Tewkſbury Wadebridge Wellington (Salop.) 23 Llandegla 24 Alconbury Arlesford Barnet Bentham Boughton Bradewell Bridgewater Broomſgrove Cambridge Canewden Colcheſt Debenham Farnham Flint Franfield Glenſford Hadleigh Halifax Kirkham (Lancaſh) Leighton (Yorkſh.) Moor-Kirk Much-hadham Newn Newton-Abbot Oxford Preiſteign Rumford Shaftſb Silverton Sodbury Wallingford Wells Witheridge 25 Bangor Barnet Canvey-iſland Forreſt-row Malham 27 Builth Cattſtreet Machynleth Newport (Pembrokeſh.) Perſhore Sarnfoldryn Wigan 28 Bolton (Yorkſh.) Bradford (Yorſh) Folkſtone Haditock Harrold Higham-Ferrers Huntington Llanvylling Standiſh Yeovil 29 Axminſt Bale Bath. Beccles Bennington Brackley Bradford (Yorkſh.) Buckfaſtleigh Buntingford Cambron Cardiff Great-Clacton. Fareham Graſſington Hartley-Row Hirton Hodſdon Hook-Norton Hunſpil Landrake Langport Lingfield Llanergnew Loſtwithiel Mansfield Newnham (Kent) Oakhampton Olney Red-Lynch Reepham Rhydylafdry Spalding Stafford Standiſh Stebbing Tolesbury Tring Wadhurſt Watton Wem Winterburn Witney 30 Bradford (Yorkſh) Bridgenorth Buxtead Harleigh Thwaite.

July 1. Criccieth Druſtwyn Haſſingden Hereford Newenden Penhurſt Thorney (iſle E.) 2 Ivilchester Richmond Teſtinivg Toller-down Walton (Eſſ.) Wickwater

water Yſtradmirk 4 Broughton H. Cheſterf Dolegelly Falkingham Green-Pool M. Leek Salop Sidney Sputty Stagſhaw-bank Wakefield White-ſmith 5 Aſhborne Bedale Bedford Beverly Biſhop's-Caſtle Brecon Bryſet Burford Cheſter Cheſterford Church-whitefield Clayton Congleton Couthorpe Croydon Devizes Dorcheſt Eaſingwould Eyminge Glouceſt Harleſtone Harriot-ſham Haxey Hertf Kennington Lancaſt Launceſton Leiceſt Lincoln Littlebourn Llanerillo Meſſing-Potton Narbeth Newbury South-Petherton Pevenſy Plint Pontypool Probus Ruiton Torrington Tunbridge Ulpho Underwood Wainfleet Wakefield Wareham Warwick Wenlock Winterton Woodland 6 Bedale Kettlewell Newcaſt (Staff.) Royſton 7 Bovey-Tracy Brentwood brumhill Chapelin-le-Firth Kenninghall Laycock Northop Painpill Penryn Taunton Uppingham Whitechurch (Hants) 8 Southwater 9 Langadock Machynleth Uffculme 11 Abbotſbury Aſhington Bala Blandford Buckingh Burley Caermarthen Dulverton Foulney's-Iſland Fordingham Godalming Grantham Hollington Holſworthy Hythe Iver Knotsford Lampeter Leeds Leominiſter Macclesfield Market-Boſworth Marlborough Mountſorrel Pembroke Peterborough Petersfield St Peter's Portſmouth Ringwood Scotter Seven-Oaks Southam Stockbridge Stockenchurch Stowmarket Sudbury Talgarth Thaverton Upton Wolverhampton York 12 Caerwith Howden 13 Congleton Eaſt-Grinſtead Neath Swanzey Wooburn 14 Spilſby Winteringham 15 St Aſaph Dronfield Great-Bedwin Little-Hadham Bury-green Brattlewell Seamore Stevenage Twyford Up-Holland 16 Burton Helmſley-Blackmoor Milkſham Newmarket (Flint) 18 Albrighton Alburi-Putmore-Heath Atherſton Banwell Bently Biddeford Camelford Chipping-Norton Cirencenſter Denbigh Emſworth Fenny-Stratf Haverford-weſt Horſham Kirton Llanidlos Llanybidar Moreton-Hamſtead Morpeth Newcaſtle (Caermarthenſh) Overton Patrington Penrice Sherborne Stockton Tenbury Topcliff Wantage Warrington 19 Bolton (Lanc.) Carphilly Clay 20 Alfreton Barkway Bergholt Berley Carleon Helſtone Honiton King's-Bridge Leonard-ſtanley Roſs Tenby 21 Beeding Bromyard Clithero Corwen Garſtang Swaffham 22 Allington Biggleſwade Billericay Chelſham Dartford Ely Frome Haworth Kidwely Monkton Newton (Hants)

(Hants) Ramſay Tetbury Whitgift 23 Colcheſter 25 Alnwick Aylesford Barnard-Caſtle Beckhamſtead *Bilſ*den *Briſtol Bromley* Campden Caſtle-acre Chelwood Little-Clackton Derby Dunwich Earith Epſom Ewhurſt Fotheringhay Giſſing Harpley Hock-hold Ipſwich Llandrhiader Leigh (Kent) Lidd Lindſey Liverpool Luggerſhall Malpas Middlewich Milton Milverton North-Down Pocklington Poulton Reading Seaford Shoreham South-Reppo Stapple Stone (Staff. Titery-place Torrington Totneſs Tregony Trew Trobridge Great-Wakering Waltham (Hants) Wigmore Wiſbeach in the iſle of Ely Yarmouth (Hants) 26 Abbey-Milton Clare Haſtings Horſmanden Kirby Llaneliom *Landſawel Leighton* (Bedfordſh.) Poſt-down Sherborne Tamworth 27 Falmouth Market-Deeping Newport (Salop) 28 *Leek* Menchinot Winchcombe 29 Chailey Mattingley Wevelsfield 30 Chilmark Hornby *Llamamon* in Yale.

Auguſt 1. Augmering Barton (Hants) Bethersden Brightlingſea *Brookland* Broughton (*Lanc*) Burnham (Norf.) *Chepſtow* Corſle-heath Cowbridge Cowling Exeter Frampton Henfield Hoo *Lampeter Landovery Lantriſſet Lidford*-green *Loughborough* St Margaret's near Marlborough Newent North-Curry Odiham Otley Partney Reddich Slaidburn St Germain's St Neots St Stephen's Stogumber Summerton Thandiſton or Francion Uttoxeter Uxbridge Wiſbeach (iſle of Ely) Whitehaven 2 Battlefield *Bridgenorth* Calne Chulmley Headon Ickleton Ivilcheſter Keſwich Kingſton Kington *Langeridge Long*-Cromarſh Magdalen-hill near Winton Mold Newark Norwich Stockbury *Stony-Stratf* Thetf Wedmore Wiſbeach Yarm 3 Daventry Hitcham Kingſton 4 Carnarvon Earl *Soham* Eſher Higham Ferrers *Llandegla* Kingſton Thirſk 5 Altringham Aſhton-under-*Line* Audly-end *Biceſter Boſcaſtle Caſtletown Chard* Cheltenham *Chertſey Chicheſt* Doncaſter Dorcheſter (Dorſetſhire.) Dudley Eccleſhal Garner-ſtreet Hatfield *Broad-Oak* Hexham Kirkoſwald Llandfechell Landgindairn Northamp Oakhamp Queenborough Ravenglaſs Rhos-Fair Saltaſh *Skipton Stamford Staverdell* Trapſton Thirſk Wattlebury Weſtbury (*Salop*) Wetherby 6 *Baldock* Eaſt-Iſley Goldſithney Holtwood Minfield Ryader *St* Anne's hill (Devizes) 8 *Crowcomb* Curryrival Horning Howey Ruthin Shepton-Mallet

Shifnal

Shifnal Stamford 9 Llanerwſt 10 Allucchurch Appleby Aſhburton Deddington Duffryn Flint Hawkhurſt Hurſterpoint Landſdown St Lawrence (Corn.) St Lawrence (Kent) Leachlede Membury Newburgh Priddy Snaith Thaxſtead Waltham St Lawrence Warminſt 11 Boſton Duninworth and Snape 12 Banbury Bettws Braidford Caergwrley Caermarthen Chriſſingham-Magna Dunholme Dunſtable Feverſham Green Hay Highworth Hornſea Linfield Malling Newcaſtle-upon-Tyne Newton (Lanc.) Plympton Sheepwaſh Shrewſb Sleaford Stowmarket Talybout Treganatha Uffculme York 13 Bakewell 15 Attleburgh Carphilly Keynſham Lelant Liſkeard Llanyfydd Market-Weſton Newport (Mon.) Oſweſtry Ottery St Harmon St Mary-Hill Stamfordham Thornbury Trecaſtle Tutbury (Worceſt.) Yarlington 16 Aſhborne Brig Burgh Louth Pentraeth-Mon Telſham 17 Dalwood Donnington Knareſborough Llanderfel Llanſannan Peny-ſtreet in Trawsfyndd 18 Aberwingregin Bedgelert Chapelin-le-Firth Clynogfawr Emſworth Navemby Rippon Settle 19 Clack Pwlhely Reath Settle 20 Abergely Blackmore Chorley Moorlinch Penmorſa Settle Weldon 22 Arundel Bedford Cayo Cheadle Crediton Farnham Frodſham Handford, Harlech Hartlepool Horncaſtle Hungerford Kilgarren Kilham Llangolen Ludlow Martock Melton-Mowbray Mwraras Newburgh Oundle Romney Rugby Settle Stroud Teſtinivg Winſlow Wondford-Eagle 23 Belford Botely Penmachno 24 Abbot's-Broomley Aſhby-de-la-Zouch Barnet South-Benfleet Brachnell Buckfaſtleigh Chipping Cranborne St Decumans Eglewsfach Kipmaſh Lambert-caſtle Lee Loſtwithiel Meer Newbury Sallcot Southwould Wainfleet 25 Barnet Bingley Coxwould Eleſmere Haughley Hermitage Landrake Lanſaiver Nefyn Partney Ripley (Yorſh.) Watchet 26 Bampton (Oxfordſh.) Barnet Bingley Bleagon Borth Carliſle Corby East-Brent Elſdon Giſborough Gourdhurſt Haverhill Hermitage Hinkley Ilminſter Little-Driffield Northampton Porthaethwry Preſton (Lanc.) Rhos-Fair Ripley (Yorkſh.) Romſey Swanzey Stroud Tollerton 27 Bingley Cerigy Druidion Giſborough Ilminſter Rhayada Ripley (Yorkſh.) 29 Cawſton Greſsford Kilmington Llanerilla Morpeth Overton Pampill Philip's-Norton Stampford Peverell Tarperly 30 Linton Newn Spalding 31 Brampton Lambert-caſtle South-Mouton Wicks.

September

September 1. Alſton Dronfield Gillingham Marnham Pontefract Spittle Tregony 2 Hingham Holywell Kettlewell Penkridge Steeple-Aſhton Snaith Stevenage 3 *Llanidlos* Long-Preſton Trefrhiw Wirkſworth 5 Aberconway Beaulieu Brighthelmſt Brigſtock Buckingh *Burnham* (Eſſex) Burwaſh Chipping-Norton Chorley Corſham Crewkerne Egdean Egton Firmingham Frampton Hatherleigh Haverford-weſt Hotringer Kidderminſt King's-Norton Kington Lampeter Leominſter Maresfield Monmouth Montgomery Namptwich Newcaſtle Old-Chapel Plyden Redruth Road Sidmouth Silverton Stalbridge Stockwith Tewkſb Toddington Wanbrough near Guilford Warwick Weitham Whittingham Wivenhoe 6 Badeſmore Camelford Donnington Market-raiſin Ware 7 Holycroſs Kilmington Newton-abbot Preſton (Lanc.) Stowly Tidſwell Wymondham 8 Biſhop's-Lydeard Cardiff Cardigan Denbury Frittenden Glaſtonbury Ormſkirk Rudland Stourbridge Talſarn Wymondham 9 Aſhford Biſhop's-Caſtle *Broad*worthy Caerwyth Carmarth. Epworth Fordingbridge Harleſtone Harlow Helſtone Leachdale Newent Taviſtock Weſton Zoyland 10 Brecon Dinaſmonddy Fowey Newport (Salop) St Mary-Cray 12 Adverſean *Brentf* Dundry Foncet Giles-hill near Winton Horſebridge-Common Horſtead Kaynes Neath Oakham Poole (Montgomſh.) Stogurſey Tamworth Tollerdown Wareham Wilton Wimple 13 Brentf Dilton Marſh Holbeach Iron-acton 14 Aſhill Baſſildon Brentf Congerbury Frome Goodneſtone Lincoln Pickering Richm Ryegate St Udey Summercourt Wherwell Winbourn Witham 15 Brentf Durham Grimſby Mark Sandbach Upton 16 *Bettws* Freſhford Lutterworth Tillingham Woolpit 17 Bellingham Llanrwſt Lee Maſham Penrice Probus Wantage Weldon Wilmington 19 Abingd Amerſham Athelſtone Barnſtaple Beauminſter Beaumaris Breewood Buckland St Mary Callington Carliſle Chatham Clack Crawley Cuckfield Eaſt-Meon Egremont Giſborough Guiſborn Harbottle near Rothbury Kirkby-Moorſide Llandyſel Little-Driffield Machynleth Maldon Market-Drayton Maſham Northamp North-Bradley Painſwick Partney Shouldham Silmiſton Staines Styning Sturbich-Fair Swindon Uſk Uttoxeter Waltham (Leiceſt.) *Waterleigh* Week St

Mary Weſterham Woodbury-hill near *Bere* Worceſter Wo[illegible]en-Courtney Wrexham 20 Dolegelly Giſborough 21 Backwell Baſingſtoke-Downs Bridgw. Burnham (Bucks) Caerleon Chudleigh Clapham Crediton Cricklade Eveſham Hawkſhead Ireby Knighton Liſkeard Lyme Maiden-Bradley Mancheſt Padſtow Penmachno Pennyſtreet in rawsfynydd Plymouth Reading Showdbrook Silſoe Tendering Thorney in the iſle of Ely Woodbr 22 Llanarth Llemuwhehleyn Yarborough-caſtle 23 Bedgelert Clynogfawr Derby Saxmundh Talgarh Tuxford 24 Bootle Haverford-weſt Langport Pwlhely Stretton-Church 26 Abergavenny Arundel Ayleſbury Boſton (Lincolnſh.) Bungay *Burford* Cheſterfield Clayton Denbigh Eaſingwould Graſſington Groombridge Hartland Hazlemere Headen Ipſwich Narbeth Newburgh Paddiham Pembroke Penmorſa Porthaethwry Ramſbury Rhayder Rockingham Rotherſtridge Shroton Spalding St Stephen Straf (Warwickſh) Tatterſhall Teſtinivg Tenbury Thetf Titchfield Waltham-abbey Wighton Wivelſcomb Wotten-Underedge Wycomb 27 Aylſham Derby Dorſtone St Ninian near Fenton Powder-*Batch* Rogate Sputty 28 Cheſham Dereham Glouceſt Llandrhiader Ludlow New-bridge North-leach Stanford 29 St Alban's Alton Aſh *Blackobys* Canterb Chagford Cranbrook, Framlingh Frewnn Henley (Oxf.) Hope Horſebridge Llangerniew Llanymyneck Loweſtoff Maidenhead Marketjew Meer Smith Southminſt Stokenchurch Teignmouth Tring Walſingf Watton Woodham-Ferris 30 *Blackburn* Brough-hill Feckenham Llanelly New-church Ongar Ruthin.

October 1. Brachnell Brading Broomſgreve Culmſton Dinaſmonddy Hawarden Catharine-hill Otley Redruth 2 Aberguilly Appletreewich Baldock *Beccles* Bolton (Lanc.) Braintree Buckingh Budworth Builth Burgh Cerne Coleſhill (Staff.) Coleſhill (Warwick.) Croydon Daventry Devizes Downton Dudley Eaſby Fordingham Hambledon Hemſley-Blackmoor Hingham Holſworthy Howden Lamborn Ledbury Lewes Malling Nayland Northallerton North-Tawton Nottingh Peterbor Retford Rothbury Rudham Sherſton Shrewſb Stafford Swine-head Tarring Warham Wendover Woodſtock 3 Corby Hounſlow Nottingh Pentraeth-Mon Sherborne Worksop 4 Alnwick Harrold Macclesfield Malham Nottingh Ubley Walſhall 5 Axminſt Druſlwyn Inglewhite

Inglewhile Lanſadwin Llanelium Llanvylling Leighton (Huntingdonſh.) Rochſ Royſton Steple 6 Biſhop-Aukland Blyth Brackley Cayo Chaplin-le-Firth Chertſey Dewſbury Eaſt-Hagburn Gaywood Market-raiſin Porlock Sherburn Wooburn 7 *B*illericay Bury Stockton 8 Challock South-Moulton 10 Aberconway Abergeny Barnſley Baſingſtoke Bedale Birmingh Blockley Brent Bridgeport Buckland Caermarthen Charlbury Cheſter Chicheſt Cockermouth Corwen Deal Dolegelly Eaſtbourne Falm. Fazley Fenny-Stratf Goſport Great Thurlow Hadleigh Hartlepool Haſlinden Hay Higham-Ferrers Hodnet Hull St Ives (Huntigdonſh.) Kegworth Kettering Kingſland Lancaſter Lanvichangel Lavenham Leiceſt Lenyer Looe Malton Marden Market-Deeping Mathry Mildenhall Milverton Mitchel-Dean Moreton Newhaven (Suſſex) Norton Ower-Mayne Penkridge Pentree Pontypool Roſs Ruſhlag-Green Sittingbourn Selby Sheepwaſh Shefford Shouldham Sleaford Smardon Solyhull South-Brent Steyning Stony-Stratf Stortford Stowe (Lincolnſh.) Swindon Taviſt Tewkſb Thame Tiverton Torrington Uxbridge Wadebridge Watlington Wells Weyhill Withyam Yarm. 11 Bedale Bedf Blackheath Burnley Coln Kingſclear Monkton *S*aliſbury Sellinge *S*hipton Wragby 12 Caxton Ditchling Hitchin Llandovery Northop Otterton *S*even-Oaks *S*uccleſbridge 13 Banbury Chappel-Cunnon Epping Lymington Manef Rackham Rhos-Fair *W*igan Windſor 14 Haworth Leybourn *S*arr Trecaſtle Waltham H. Wells 15 Aſhover Carliſle 17 Alceſter Alphinſton *S*t Aſaph Bakewell Balbroughton Chriſt-Church Cowling Donnington Havant Ivinghoe Knareſborough Llandriader Lyſſin-Alwyd Llemuwchllyn Maidſt Navenby Swinſtead Thorne Turner's Hill Wellow Wenlock Wooler 18 *B*arnet Belbroughton Little-brickhill Charleton Chipnam Cheſleborough Cowbridge Criccieth Dorſton Everſley Farringdon Haleſworth Harwich Hatfield Haverford-weſt Henley (Warwickſh) Hindon Kirkham (Lancaſh.) Lantriſſent St Laurence Laxfield Lutton Midhurſt Newham (Glouceſterſh) Newton-Peppleford Overton Partney Tidſwell Uphaven Uſk Winterburn Workington 19 Aberford Barnet Cor Caſtle Lamamon-in-Yale Lampeter Market-Harborough Partney Sawbridgeworth Teſtinivg Trevena White-Church (Hants) 19th and the two following Saturdays at Swanzey 20

Aſhborne Cerigy Chicheſt Colcheſt Druidon Devizes Elſham Ely Gainſborough Heref Kingſbrumpton Rothersfield Slaidborn Tenby 21 Blackburn Bridlington Concerdd Rudgley 22 Barking Booth Carliſle Clithero Newmarket F. Newport Pagnell Overton 24 Aberfraw *Brampton* (Devonſh.) Barth Burrowbridge Caiſſer Clocaynog Dalton Harling Haſtings Llangedock Lanſawel Leighton (Bedfordſh.) Lenham Market Drayton Marſhfield Matlock, Newn Porthaethwry Ripley (Derbyſh) Sputty Stow (Glouceſterſh) Sturminſt Tamworth Upottery Wainfleet Winton 25 Aberwingregin Cartmel Mortimer Potton Perſhore Queen-Camel Stockport Whittleſea in the iſle of Ely 26 Abberford Grantham Llandegla Llanſannan Ovingham 27 Aberguilly Bromyard Caergwrley Cleobury-Mortimer Darley Daventry Flaſh Marſh in the iſle of Ely Nantglyn Ulverſtone 28 Aſhby-de-la-Zouch Aſtrig Bangor Biddenden Biggleſwade Chepſtow Collumpton Driſs Droitwich East-Dean Edwinſtone Forreſt-Row Llanidlos Liſton Linfield Milbourne-Port Needham Newbury New-market (Suff.) Pocklington Plympton *South*-Harting Thirſk Totneſs Warminſt Warton White-church (*Salop*) 29 Abbey-Holm Ambleſide Aſtrig Banbury Bourn Bridgenorth Broadwater Burton Chagford *Charring* Chedder Ewell Halſted Hampton Henley (Oxf) Holt (Denbigh) Howey Hunmanby Kidwely King's *Cliff* Kirkby-*Stephen* Marlow Mongham Newcaſtle (Northumb.) Pleaſley Radnor Sedberg *Stainton* Thirſk Towceſt Tunbridge Wellinborough 31 *Crowcomb* Llanllechyd Newhaven (Derbyſh.)

November 1. Coventry Earith Fordſtreet Llanybiddar Lytcham Newark Preſcott Rothbury *Settle* Wadhurſt Walden Wingham 2 Altringham *Bletchingly Buckland* Chard Downham Farnham Helmſley-Blackmoor Hoxne Loſtwithiel Loughborough Toddington Wilton Workingh Wye 3 Bromfield Campden Poole (Dorſ.) Swaffham Talgarth 4 Eccleſhall Litchfield 5 Appleſhaw Llanfechel 7 Barwick-hill Helmſley-Black-moor Horley Lampeter Mancheſt Middleham-moor Newton-Abbot Newcaſtle (Staff.) Newport (Monmouthſh.) Rochdale Sutton (Hants) Talſam Trefrhiew Tregony Witchbury 8 Abercouway Alford Barton Underwood Bingham Blandf. Buckingh Chilham Chipping-Norton Cirenceſt Dulverton Dunmow Hatherleigh Helſtone

Herf

Hertf Hexham Kendall Kighly Knotsford Llamedy Llanrhiader Leeds Leominſt Lidney Maſſingham Penſford Romſey Stamf Stratton Sutton (Warwickſh.) Warwick Whiſton Woodſtock 9 Albrighton 10 St. Auſtle Caerwith Chapeline-le-Frith Fallingham Potlock Ruthin 11 Aſhburton Brandon Cambron Langport Lenton near Nottingh Liverpool Macclesf. Newburgh Nunny Penrith Pwllhely Retford 13 Ambwich Bifley Blackney Brampton Callington Camrals Chelmsf Chirk Dunſtable Fairford Halcheſton Kilgarren Kilham Lanwinion Lincoln Little-Mountain North-Moulton Penmorſa Pentraeth-Mon Rowland's-Caſtle Stelling Stony-Stratf Three-Lords Wakefield Wooburn 14 Allentown Ambersbury Biddeford Biſhop's-Caſtle Carmarth Dinaſmonddy Elleſmere Giſborough Huntingd Kingſt Llanerrillo-Leek Loddon Mayfield Montgomery Porthaethwry Teſtiniog Trecaſtle Wakef Wotton-Baſſet 15 Egton Otley 16 Andover Beverley Poole (Montgomeryſh.) 17 Brecon Bridge-end St Columb Headon Hunmanby Ingleton Launceſt St. Leonard's near Bedford St Leonard's (Suſſex.) Malling Newp Otterford Warſop Willington Wells Yeovil 18 Cuckfield Durſtone 19 Croſs-in-hand Truro 21 Aberwingregin Conywydd Dolton Feltwell Lanufydd Llanybiddar Petworth Ruabon Skipton 22 Battle Bawtry Boſcaſtle-Bow (Devon.) Brigſtock Clunn Crowle Darlington Deddington Dolegelly Dover Fairbach Falkingham Fillingham Guilf Haltwiſtle Hempton Llangollen Lawhaden Marlb Martin's-Town Mold Monm. New-Buckingh Newcaſt (Carmarthenſh.) Pembridge Ripp n Rugby Scarbor Shaftſb Shifnal Skipton Stamford-Bridge Standiſh Storrington Warkworth Wem Wetherby York and every other Thurſday in the year at York 23 Whitney 24 Colesford Eglwyſfach Holt (Norfolk) Langtown Penzance 25 Cheſterf Chipping-Norton Elſtow Frome Graveſend Machynleth Thwaite 26 Caſtletown St Ives Landovery Llanfechel Little-Dean 28 Bakewell Eglwyſwrw Fenny-Stratf Glouceſt Gorſynon Harlow Hartlepool Hook-Norton Horſham Northamp Sheffield Spaldock 29 Aſhborne Endfield Llangerniew 30 Alfriſton Belchamp St Paul's Broadhembury Broomhall Buntingford Cardiff Chipnam Colyton Cubley Flint Fring Hempnall Llanſannan Maiden-

head

head Moreton Hampſtead Northwould Preſteign Warrington Wells *Week St* Mary.

December 1. Hythe Ingateſtone Penrice Rotherham Tutbury 2 Sputtey 3 Aſhton-under-line Bettws Garſtang Louth Talgarth 5 Atherſtone Carnarv Durſley Greſsford Lamborn Newark Penybout Pluckley Sandw *Staff* Tenby *Wenlock* 6 Bodmin Builth Cornhill Cranborne Exeter Greſſinghall Launceſt *St* Nicholas Northwich *Sidland Stoke* (*Norf.*) Toddington 7 Cerigy Druidion Clithero 8 Llaneliom Leiceſt Ludlow Malpas 9 *Barnſtaple* Bradfield Leybourn 10 Bewdley Bolney Lanon Liſkeard Newmarket Fl. Newport (*Salop*) *South*-Moulton 12 Aberfraw Abingd Ampthill Baldock Bettws *Bewdley* Bolney Boſton *Brackley* Chagford Chawley Coham Colingburn Duces Eaſt-Crimſt Gaygrave Gringley Harlech Kimbolton Kirton Langadock Langport Llanrwſt Narbeth Oſwettry Petersf Ringwood R. cheſt Roſs *Shrewſb Stratton* Taviſtock 13 *Bedale* Knareſb 14 Thirſk Trecaſtle 15 Kettering Namptwich 16 Comb Dolegelly Newn *St* Nicholas 17 Arundel Grantham Helſtone Higham-Ferrers Hornſea *St* Neot's North-Tawton *Spalding Wallingford Woodſt* 19 Beaumaris Bedf *Cardigan* Ledbury *Northampt* Painscaſtle Thornbury Truro *Wotton-Baſſet* 20 Bradf (Yorkſh.) 21 *Boxford Bradford* (Yorkſh.) Droitwich Grinton Hawarden Highbickinton Kirby-Lonſdale Laycock Penryn 22 Bradford (Yorkſh) Carphilly Newport-Pagnell 24 Alnwick Hawarden Llanwnen 26 *St* Aſaph *Beckley* Korwen 28 *Cock*-Hill 29 *Bridge*water Stonehouſe 30 Milbourn.

FINIS.

